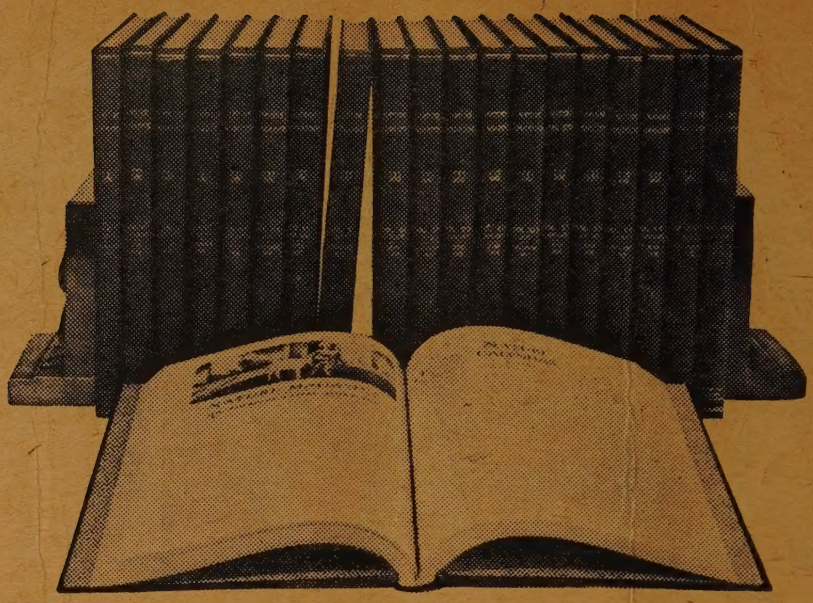
Illinois U Library

NATURE MAGAZINE

vember, 1947 50 Cents Vol. 40, No. 9



A Storehouse of Nature Information

(Fully Indexed)

Bound volumes of NATURE MAGAZINE give you an incomparable reference library on Nature subjects unobtainable elsewhere at any price. Here is an encyclopedia of Nature information—a wealth of fascinating stories about BIRDS, MAMMALS, FISHES, PLANTS, TREES, the SKIES and other phases of Nature and the outdoors, all profusely illustrated with photographs, paintings and line drawings. Many of the volumes have illustrations in color. Scientifically correct and unique in scope and completeness. Your school, your library, your home, will be enriched by possessing these valuable and attractive volumes.

Indexing Makes the Information Available

No magazine is as thoroughly indexed and cross-indexed for each volume as is NATURE MAGAZINE. With a special ten-year index covering the first twenty volumes of NATURE MAGAZINE and with complete indexes to subsequent volumes down to date NATURE MAGAZINE is an outstanding reference work. With the growing emphasis upon visual education and upon pictures in study work such careful indexing is invaluable, and since every picture is listed in the index there exists nowhere an equal pictorial presentation of Nature than in a set of these bound volumes. Schools, libraries and individuals who have preserved and bound their magazines have amply proved the truth of this.

Don't forget the importance of an index. A good book with no index is worthless for reference purposes. A good book with a poor index is almost as worthless. NATURE MAGAZINE is a superb and unique book with an outstanding index.

Volumes 1 to 30 each include six issues of NATURE MAGAZINE. Commencing with volume 31, ten issues are bound into attractive volumes. Volumes 1 to 19 are bound in dark green cloth with gold letters. All subsequent volumes are bound in dark brown imitation leather and stamped in gold. Volumes 1, 3 to 10, 24, 33 to 36 have been completely sold.

A REAL VALUE AT THESE PRICES

Volumes 2, 11 to 30.....$3.00 each: Two or more volumes.....$2.50 each
Volumes 31 to 39.....$5.00 each: Two or more volumes.....$4.00 each

Mail your order promptly, using the convenient coupon. Or write separately if you do not wish to mutilate your magazine.

AMERICAN NATURE ASSOCIATION
1214 Sixteenth Street, N. W., Washington 6, D. C.

Vols. II to XXX Containing Six Issues $3.00 Each

Send me postpaid the bound volumes of Nature Magazine checked below.

My check for ..... in full payment is enclosed.

Name .....

Street and No. .....

City and State .....

2	11	12	13	14	15	16	17	18	19	20	21	22	23	25	26	27	28	29	30	31	32	37	38	39

Volumes XXXI to XXXIX containing Ten Issues $5.00 Each.

Illinois U Library

Nature Study Meeting

A cordial invitation to all interested in the study of Nature is issued by the American Nature Study Society to attend the sessions of its annual meeting to be held in Chicago, December 27 to 30, inclusive. The headquarters will be at the Hotel Sherman, and a varied program for the

The Children's Book for CHRISTMAS

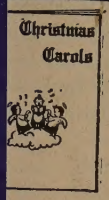
96 Lavishly illustrated, gorgeously printed big 9x12 pages jammed full with beautiful Christmas Stories, Carols, Poems, Songs, Pictures, Articles, Photos, etc. 6 books in 1! Over 42 different delightful

So Astonishing You Won't Believe Your Eyes!

AMAZING PICTURE BOOK

One of the most Amazing Picture Books you've ever seen! Pictures leap into life So Real and Thrilling, you'll gasp with delight! They Almost 60c em alive! Thrilling, Delightful effects guaranteed to ntertain both young and old. Large 8½x11" size, llustrated cover. With viewing spectacles. Makes a onderful gift! Just 60¢ each, 3 for $1.50. 6-$2.75, 2-$5.00.

HRISTMAS CAROLS



Words & Music to all the delightful Christmas Carols, both familiar and not so familiar. Beautifully printed! Plus absorbing stories about the carols interestingly told with nice illustrations. Over 30 different carols! 8½"x5½", 48 pages, illus. cover. Nicely printed. 25¢ each, 6 for $1.25, 12 for $2.00. 25c

THE CHILDREN'S **BOOK OF FUN**

48 pages of entertaining Pencil Puzzles, Picture Puzzles, Pencil Games, Limericks, Anagrams, etc. Guaranteed to delight and amuse any child 6-15. Over 90 different selections, every one illustrated! Illus. cover, size 5½"x8½". 25¢ Each, 6 for $1.25, 12 for $2. 25c

Christmas Books 15c

eautifully printed, generous 5½"x8½" size, up to 32 ages & cover. Many entirely illustrated! 15¢ each, 6 r 80¢, 12-$1.40, 25 for $2.50.
01-Christmas Stories. Short, light-hearted, Breezy ories. 102-Dickens' Xmas Carol: told entirely in ictures with text! Part 1. 103-Part 2 of »Dickens' mas Carol story in pictures. 104-Christmas Scenes om Movies: consists entirely of Xmas photos. 105-hristmas Carols. Words & music to many carols. 06-Night before Xmas: 13 illus. with text. 107-hristmas Poems. Choice Selections. 108-Xmas in erry Old England: Interesting selections. 109-The ativity-Religious holiday discussions.

591-TZ, LYNN, MASS.

riminating Correspondent

l for personal correspondence, thank you notes. They are g envelopes to a box.

NOTEHEADS

s from paintings by Kathleen rden Club officials and approved There are fourteen designs and

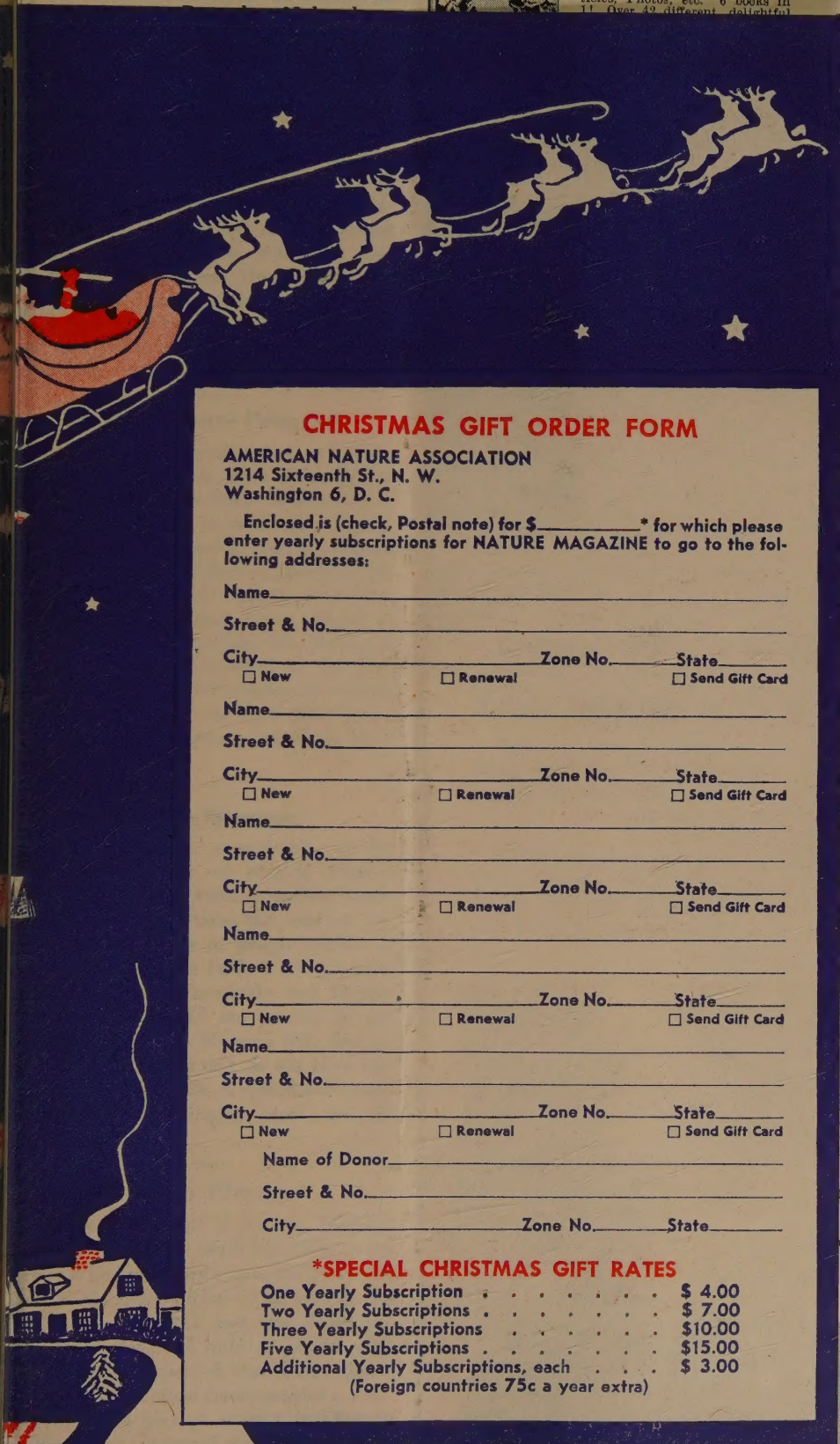
N BIRD NOTEHEADS

boxes of these attractive note- n purchased by Association mem- y reproduced in full color from n elephant folio of the BIRDS by John J. Audubon.

DS
G ENVELOPES, **$1.00**
n attractive box)

noteheads you want and order from

N NATURE ASSOCIATION
N. W. Washington 6, D. C.



CHRISTMAS GIFT ORDER FORM

AMERICAN NATURE ASSOCIATION
1214 Sixteenth St., N. W.
Washington 6, D. C.

Enclosed is (check, Postal note) for $_____* for which please enter yearly subscriptions for NATURE MAGAZINE to go to the following addresses:

Name_____
Street & No._____
City_____ Zone No._____ State_____
☐ New ☐ Renewal ☐ Send Gift Card

Name_____
Street & No._____
City_____ Zone No._____ State_____
☐ New ☐ Renewal ☐ Send Gift Card

Name_____
Street & No._____
City_____ Zone No._____ State_____
☐ New ☐ Renewal ☐ Send Gift Card

Name_____
Street & No._____
City_____ Zone No._____ State_____
☐ New ☐ Renewal ☐ Send Gift Card

Name_____
Street & No._____
City_____ Zone No._____ State_____
☐ New ☐ Renewal ☐ Send Gift Card

Name of Donor_____
Street & No._____
City_____ Zone No._____ State_____

***SPECIAL CHRISTMAS GIFT RATES**

One Yearly Subscription	$ 4.00
Two Yearly Subscriptions	$ 7.00
Three Yearly Subscriptions	$10.00
Five Yearly Subscriptions	$15.00
Additional Yearly Subscriptions, each	$ 3.00

(Foreign countries 75c a year extra)

apologizes to the squirrels for accusing them of pillaging partly destroyed hummer's nests.

Nature in Print

By HOWARD ZAHNISER

AFTER a summer spent mostly in a small cabin "office," where only a few rather low trees have hidden from view the Teton Mountains, it is a rather curious experience to be spending the very last cabin hours conning books that have been written about experiences with natural life in and about cities. Much more familiar is the experience of sitting in one of many crowded dwellings thinking of far-away mountains. Curious that one should so frequently be led into thoughts of the far-away!

Yet this happening seems a kind Providence, indeed, for in these books—*Enchanted Streets* by Leonard Dubkin and *Spring in Washington* by Louis J. Halle, Jr.—there is more than an intimation that one need not sacrifice entirely the preserving sweets and acids of wildness in order to know for a season the pulsations of urban living and to serve there his generation as it seems to will that he should.

Leonard Dubkin was for a year without the employment status that usually seems essential for the dignity of urban dwellers. There are few who will doubt that within that year he saw more of the fascination and wonder there are in the natural world than thousands of visitors to our national parks. At the end of the year, when he took a Polyphemus moth fresh from its cocoon to the office of a doctor, who by chance had earlier seen and scoffed at Mr. Dubkin's own fascination, the doctor told him: "You know, when I think of all these years of my life that I thought nature could have no interest for a serious-minded man, I feel that I ought to offer an apology to nature. And I should also apologize to you. . . . Why don't you write a book, to open people's eyes . . .? Then, you see, your nature-studying would become socially useful."

Thus *Enchanted Streets* began to be written. It is an intensely interesting narrative. Its beginning—its account of how Mr. Dubkin became "unemployed"—is as good a story as ever a reviewer was tempted to lift from his author, and the happenings to Mr. Dubkin throughout the year are also interesting. Yet the book is essentially another revelation of how varied and intriguing are the little life happenings that are daily ignored by men and women who think that their own arrangements for comfortable existence are the actual realities of life.

This revelation is surely socially significant, as Mr. Dubkin says, even if it does no more than open eyes for the exhilaration of those who travel streets. There is, perhaps, a bit of human, racial smugness in considering social significance as the supreme virtue of activity—as though all of life had meaning only as it might make better the living of men with each other —other men. But Mr. Dubkin's ardent humanitarian doctor did not obscure for him the broader meaning perceived through his observations of other forms of life and his sympathy with them. (Speaking of a Polyphemus pupa from an opened cocoon, Mr. Dubkin says, "I like to hold the soft, cold, helpless brown thing in my hand, to meditate on its utter defenselessness [after he had opened the cocoon!] and to feel its segmented bottom wiggle back and forth as though in protest.")

For Mr. Dubkin receives also from his observation a valu "in the insight it gives us into the lives of beings other tha ourselves." He writes a simple statement, but with the ove tones of poignant protest, when he says: "We pass othe mysterious creatures without seeing them, and we ruthlessl trample on absorbing enigmas without hearing their deat cries." The ease of this disregard of life, and the difficulty gaining an insight into life's realities, are, perhaps, the greate tragedies for urban men and women—the city influences tha perhaps give deepest meaning to an opportunity to live for while now and then amongst trees and at the foot of mountain away from the city. It would not be fair to avoid emphasizin that *Enchanted Streets* is, in fact, a narrative of enchantmer and of exciting incidents of a man making strange discoverie Yet one can not deny the impression that Mr. Dubkin epit mizes his conclusions when he says: "Man is a passenger o this planet earth, en route from one oblivion to another. Shoul he not be curious about the business and destination of h fellow-passengers?"

Curiously similar are the fin sentences of *Spring in Washin ton,* in which Louis J. Halle, J likens himself to a traveler b ing "hurried on a schedule n of his making and for a purpo he does not understand" a then concludes: "Meanwhile t spectacle itself is beautiful, i mense, awe-inspiring. He think in default of other guidance, had better make a few hurri notes on it in his passage. Th much he must attempt, leavi his notes behind as an acknow edgment of this strange hos tality and the gift of vision, a as a record by which oth travelers may recognize the similar experiences."

But Mr. Halle's notes a more like the symbols of mus than like the jottings of touris and in his composition on season are the tones and ov tones of a music that will be heard by many more ears th have yet sensed it. For Mr. Halle (nor Mr. Dubkin either) not as melancholy as the minor strains of his conclusion mig sound. The pain of uncertainty in the still prevalent illusi that men are without moorings, blindly traveling, is even n being eased by this music and will not last forever. Wh human beings sense their membership in the whole communi of living things, their part in the symphony of all life, a realize within themselves the continuity of generation af generation, the earth's goodness will no longer seem a "stran hospitality" and men will know they are at home.

Such creations as *Spring in Washington,* such testimonies *Enchanted Streets,* are hastening this awareness. "I wonde writes Mr. Halle, "that there has been so little comment amo us on the fact that nature is invariably beautiful," and his s ing so makes a difference. Mr. Dubkin, in Chicago, has se how the wildness that is not, and can never be, urban has p sisted in the city—how the life of other creatures persists sharing the life of men. Mr. Halle, it seems, has gone farth as perhaps his better opportunity permitted, and has perceiv that the life of the city—all-important as it may seem—is s rounded by and a part of the still-wild, in the sky above city where the night herons fly and croak as well as in the m distant environs of the city that Mr. Halle can reach on bicycle between dawn and the office hour, which many take the time when life begins again. His book is a lyric narrat of explorations in and (mostly) about the nation's capital

Strange Affinity

By COSETTE MIDDLETON

I paused beside the brook one night to see
How jealously it cradled stars; a wedge
Of moon was snagged among the reeds and sedge;
I heard a pompous frog rehearse off-key.
The wind that whispered in the night's warm throat
Spoke in a tongue I almost understood;
Anonymous, within the distant wood,
A night-bird sobbed a half-remembered note.
The universe was small that night, contained
Within that sphere of peace where shadows curled
Beside the figure of a sleeping world—
I caught and held the secret that explained
The strange affinity I chanced to find
Between the darkness and the listening mind.

he spring, interspersed with contemplative essays on the meaning of his experiences. Enhanced by the complementary art of Francis L. Jaques, it is a volume for deep enjoyment as well as a guide toward health. As a guide it is both social and individual and, more than a guide, it is a warning—the sort of warning that is being more and more heeded and more and more needed.

Thinking, for example, of those who caution him about getting his feet wet in marshes, Mr. Halle comments, in part:

"The price of too much comfort is the loss of freedom. I had as soon become addicted to alcohol or opium as to the comforts of the hive. . . . By retreating from the world and insulating ourselves against it we are achieving a security as spurious as our comforts are hollow. . . . had rather be strong in my own strength to resist disease than to give up my strength in the hope that civilization will protect me from exposure to it. . . . A lady I knew had a parrot she kept in a steam-heated apartment, covering its cage with a flannel every night. She was at a loss to know how I could let my parrot climb among the trees in a snowstorm, when hers would be killed by a cool draft. She contented herself that her parrot was delicate (without asking why) and, to take no chances, heaped on an extra flannel at night. One night the flannels slipped off and next day the parrot was dead. God save me from such loving care and give me wet feet. God save me from those doctors who will rob me of my health to keep me well."

Enchanted Streets: The Unlikely Adventures of an Urban Nature Lover. By Leonard Dubkin. Boston: Little, Brown and Company. 1947. 210 pp., with 7 illustrations by Adouard Sandoz. $2.75.

Spring in Washington. By Louis J. Halle, Jr. New York: William Sloane Associates, Inc. 1947. 227 pp., with end-paper map and 48 drawings by Francis L. Jaques. $3.75.

Peterson's Bird Guide

A Field Guide to the Birds: Eastern Land and Water Birds. By Roger Tory Peterson. Boston. 1947. Houghton Mifflin Company. Revised and enlarged edition. 290 pages. 1000 illustrations. 500 in full color. $3.50.

Just as soon as Roger Peterson got himself separated from his army uniform he set to work on a schedule of long hours devoted to the revision of this standard book, back orders for which had piled up with his publishers during the war. This revision included the making of many more color plates, thus to make of this book the best and most complete guide to the land and water birds of the eastern United States. This is, of course, an identification text, the book one carries along in pocket or knapsack for study of birds in the field. Peterson does not go into the life histories or many other details of the birds. This is logically left for other bird books presumably in the bird lover's library. Peterson, therefore, includes only those details that will aid the observer in identification, indicate the difference between male and female, or are otherwise notably characteristic of the birds. The book is simple to use. It should be noted that the description of the book as dealing with "eastern" birds is not as exclusive as one might assume. Actually it covers land and water birds found as far west as eastern North and South Dakota, Nebraska, Kansas, Oklahoma and Texas. Interesting end pieces show roadside silhouettes of 28 perching birds and 26 birds in flight. The second edition of Peterson's *Guide* won the Brewster Medal of the American Ornithologists' Union. This third edition could well be a candidate also.—R. W. W.

Deserts Still March

Deserts on the March. By Paul B. Sears. Norman, Oklahoma. 1947. University of Oklahoma Press. 178 pages. $2.75.

Since it was first published a dozen years ago, this book has become a "classic" in the conservation field. It sounded the alarm of the dust bowl era, and had no little to do with the conservation practices of depression times that sought to win back the ground lost in our profligate abuse of our soil resources. The passage of the past twelve years has seen great progress in soil conservation, and has also seen the greatest war the world has known, with its tremendous drain upon natural resources. Thus a new edition of this book, with revisions and an added chapter, takes on new significance and should command the attention of all Americans.

Botanical Gardens

The Arboretums and Botanical Gardens of North America. By Donald Wyman. Waltham, Massachusetts. 1947. The Chronica Botanica Co. New York. Stechert-Hafner, Inc. $1.50.

Actually, this is Volume 10, Numbers 5 and 6, of *Chronica Botanica,* but it stands by itself as a volume representing an important contribution to botanical literature. The title is, of course, descriptive. An introductory chapter gives advice on the establishment and maintenance of an arboretum or botanical garden. Then are listed, with details as to their size, content, function, endowment, budget, library and so forth, the active institutions of this sort. There are several drawings showing plans of such areas, and a group of interesting photographs. Dr. Wyman has done a notable task in assembling an immense amount of valuable information never before brought together in such form.

The WORLD'S Greatest Roller Skates

For those who want the best, it's "CHICAGO"—the greatest name on Roller Skates. Equipped with TRIPLE-TREAD, "TRIPLE-WARE" Steel Wheels for endurance and long wear. Perfect Ball Bearings assure smooth running with greatest SPEED. Rubber Cushioned Shock Absorbers remove the discomforts of rough spots, making them safe for the youngest child.

"CHICAGOS" are the Choice of Champions. If you cannot obtain them now—it will pay you to wait. See your Dealer TODAY!

CHICAGO ROLLER SKATE CO.
World's Greatest Roller Skates for Over 45 Years
4451 WEST LAKE STREET • CHICAGO 24, ILLINOIS

SHAKESPEARE NATURE CALENDAR FOR 1948

This outstanding calendar has the endorsement of Shakespeare lovers throughout the nation. Dramatic teachers, students, pictorial artists, schools, libraries and clubs have said it filled a long felt need.

It is a new and welcome way of showing what a great naturalist Shakespeare was. It brings him closer to our daily loves. It helps to make familiar his gems of thought, to be always kept and cherished. It contains a biographical sketch of Shakespeare. It is the second and better calendar published and illustrated by Edward C. Avery, Honorary President, Buffalo Audubon Society, Inc.

$1.00 per copy, Postpaid. Order now from

EDWARD C. AVERY
114 Mariner St. Buffalo 1, N. Y.

Say "Merry Christmas"
with
CARDS of WOOD
Distinctive, Different, Greeting Cards

YOUR friends will exclaim over and treasure these charming novel CARDS OF WOOD. Wafer-thin, flexible, made of Holly, Pine, Cedar, Maple and other exquisitely grained woods. 3¾" by 4¾", printed with appropriate and attractive designs and messages. Assorted, beautiful cards with envelopes and folder. Always sold direct. Send $1 for 3, all different.

CARDS of WOOD
MANLIUS, 2, N.Y.

Save-the-Redwoods

Send 10 cents each for these attractively illustrated pamphlets: "A Living Link in History," by John C. Merriam ... "Trees, Shrubs and Flowers of the Redwood Region," by Willis L. Jepson ... "The Story Told by a Fallen Redwood," by Emanuel Fritz ... "Redwoods of the Past," by Ralph W. Chaney. All four pamphlets free to new members—send $2 for annual membership (or $10 for contributing membership).

SAVE-THE-REDWOODS LEAGUE
250 Administration Building,
University of California, Berkeley 4, Calif.

NATURE MAGAZINE

PUBLISHED BY THE AMERICAN NATURE ASSOCIATION

To Stimulate Public Interest in Every Phase of Nature and the Out-Of-Doors, an

Devoted to the Practical Conservation of the Great National Resources of Americ

IN THIS ISSUE

November, 1947 Vol. 40, No. 9

Raccoon .....Frederic Sweney Cover
Nature in Print.....Howard Zahniser 450
Strange Affinity (Poem)..Cosette Middleton 450
Contents Noted.....R. W. W. 455
Our Olympic National Park—Let Us Keep All of It..Herb Crisler 457
The Platypus at Home....Alec H. Chisholm 461
Louisiana Live Oaks.....Robert H. Harper 464
The Romance of Spices....Andrew S. Wing 467
What Is New in Meteorology? Edna Hoffman Evans 470
Windows into the Sea....Hugo H. Schroder 473
Albert Lives the Life of Riley.....Lilo Hess 477
The Mourning Dove.....Edward A. Preble 479
Public Land Threat Takes New Turn (Editorial) 481
Flat as a Halibut.....Edward W. Allen 482
Little Lanes that Wander (Poem) Marel Brown 484
Baltimores and Serendipity Edna Peck Atwood 485
Great Comets Are Few in Number Isabel M. Lewis 489
Space Travel (Poem).....Irene Stanley 490
Camera Trails.....Edna Hoffman Evans 491
The School Page.....E. Laurence Palmer 493
Camping Education.....Dorothy Miller 494
Under the Microscope..Julian D. Corrington 502

NATURE MAGAZINE, PAST AND PRESENT, IS INDEXED IN THE READER'S GUIDE IN YOUR PUBLIC LIBRARY

U. S. AND CANADA
ONE YEAR.....$4
FOREIGN...$.75 EXTRA
TWO YEARS.....$7
LIFE $100

A. B. McClanahan, Advertising Manager

ADVERTISING OFFICES

New York 17—295 Madison Avenue Los Angeles 15—Western Pacific Bldg.
Washington 6—1214 16th St., N.W. San Francisco 4—Mills Building
Chicago 1—203 N. Wabash Avenue Minneapolis 2—233 Radisson Hotel

NATURE MAGAZINE is published monthly, October to May, inclusive, bimonthly, June to September, inclusive, by the American Nature Association. Entered as second-class matter May 31, 1927, at the post office at Washington, D. C., U. S. A., and accepted for mailing purposes at the special flat rate of postage provided for in the United States Postal Act of October 3, 1917, and February 28, 1925. $4 a year; foreign $4.75.

Publication and Editorial Office, 1214 16th Street, N.W., Washington 6, D. C.

Copyright, 1947 by American Nature Association. Title Registered U. S. Patent Office. Printed in the United States.

THE ASSOCIATION

RICHARD W. WESTWOOD.....Preside
Washington, D. C.

HARRY E. RADCLIFFE.....Vice-Preside
Washington, D. C.

JAMES A. O'HEARN.....Secretary-Treasur
South Orange, N. J.

DR. E. LAURENCE PALMER.....Director, Nature Educatio
Cornell University, New York

ARTHUR NEWTON PACK .....President Emeritu
Abiquiu, N. M.

THE MAGAZINE

RICHARD W. WESTWOOD.....Edito
EDWARD A. PREBLE.....Associate Edito
JULIAN D. CORRINGTON.....Microscopy Edito
ISABEL M. LEWIS.....Astronomy Edito
E. LAURENCE PALMER.....School Edito
ANDREW S. WING.....Garden Edito
HOWARD ZAHNISER.....Book Edito
EDNA HOFFMAN EVANS.....Photograph Edito
R. BRUCE HORSFALL.....Arti
HARRY E. RADCLIFFE.....Business Manag

SCIENTIFIC CONSULTING BOARD

DR. LELAND O. HOWARD
Retired Chief, U. S. Bureau of Entomolo

DR. WALDO L. SCHMITT
Curator of Marine Invertebrates, U. S. National Museu

DR. HARRY C. OBERHOLSER
Cleveland Museum of Natural Histo

W. L. McATEE
Technical Adviser, U. S. Fish and Wildlife Servi

DR. PAUL BARTSCH
Curator of Mollusks, U. S. National Museu

DR. EDGAR T. WHERRY
Wild Flower Preservation Socie

DR. WILLIAM M. MANN
Director, National Zoological Pa

NATURE on PARADE

An album of more than one thousand of the finest Nature Photographs ever taken

Only $5.00 *postpaid*

A beautiful book, size 9 x 12, 388 pages, bound in dark green imitation leather, Spanish grain, soft padded cover, stamped in gold leaf.

Since NATURE MAGAZINE made its bow in January, 1923, thousands of Nature pictures have been reproduced on its pages. These constitute the most remarkable pictorial parade of Nature ever published. The editors of NATURE MAGAZINE have reached out to gather together the best in Nature pictorial features, presenting them through the graphic process of rotogravure. More than one thousand outstanding nature pictures are presented, with descriptive story relating to them. They unfold the camera's record of the life history of birds, mammals, or insects; or they represent typical flowers, trees, and other Nature forms of a certain region. A book of surpassing beauty and constant interest.

The edition is limited to one thousand numbered copies

Mail your order today to

AMERICAN NATURE ASSOCIATION

1214 Sixteenth St., N.W., Washington 6, D. C.

HOTEL STRAND

Atlantic City's Hotel of Distinction

The Ideal Hotel for Rest and Relaxation. Beautiful Rooms. Salt Water Baths. Glass inclosed Sun Porches. Open Sun Decks atop. Delightful Cuisine. Garage on premises.

Fiesta Grill and Cocktail Lounge

Exclusive Pennsylvania Avenue and Boardwalk

Books for the World

So great and continued is the need for American publications to serve as tools of physical and intellectual reconstruction abroad, that the American Book Center for War Devastated Libraries has continued its work and makes renewed appeal for donations of books and periodicals, for publications of intellectual merit in all fields, particularly for volumes published during the past ten years. Contributions should be shipped to the American Book Center, c/o The Library of Congress, Washington 25, D. C., freight prepaid. Or write to the Book Center for further information.

Sketching

Sketching Landscape. By Victor Perard. New York. 1947. Pitman Publishing Corporation. 64 pages. Illustrated. $1.00.

This is a book to be copied by anyone with artistic talent and an interest in landscape drawing. It is a guide to the development of pencil drawing, and simplification of the complicated scenes that manifest the beauty of Nature. Pen technique instructions are also included, as well as the proper methods of pencil control. Directions in what to look for first in landscape drawing help dispel early bewilderment, and following suggestions narrow Nature's panorama down to individual trees, vines, and plants. In addition, Mr. Perard teaches how to enlarge and reduce a picture, the use of close-ups and accessories in the foreground of a landscape composition, and the art of quick sketching. This is a book particularly for those who like not only to see but also to reproduce the out-of-doors.

Gadgets

Almost daily, evidence of American inventiveness and ingenuity comes to hand, some of the gadgets announced having a Nature significance. So we shall, from time to time, announce them as a service to readers.

From the Chicago Wheel and Manufacturing Company, 1101 West Monroe Street, Chicago 7, Illinois, comes announcement of a "Handee Plastic-Craft" outfit through which various things may be encased and preserved in clear plastic. Inquiry reveals that this process is not adapted to the preservation of actual Nature specimens, but it can be used to preserve and permanently mount replicas of specimens. Full details from the manufacturer.

From the Art Metal Appliance Company, 3110 Park Avenue, St. Louis 4, Missouri, comes announcement of a new, all aluminum, light weight, portable, outdoor stove known as Port-O-Stove. It is fueled by low-cost liquefied petroleum gas. The stove weighs 5¾ pounds; the gas cylinder 7 pounds.

A TOOLSHOP IN YOUR HAND

GIFT OF A LIFETIME FOR A FRIEND OR YOURSELF

The first tool of its kind—today's finest. Smooth, steady power at your fingertips, easy to handle. Make ship, plane and train models, book-ends, internally carved costume jewelry, etc. Grinds, drills, polishes, routs, carves, sands, saws, engraves on metal, wood, plastic, glass. 25,000 r.p.m. AC or DC. Wt. 12 oz. In steel case with 40 accessories, $27.50. Handee only with 7 accessories, $20.50. At stores or sent postpaid. CHICAGO WHEEL & MFG. CO. 1101 Monroe St. Dept. NA, Chicago 7, Ill. Free 52-page Manual.

HANDEE TOOL OF 1001 USES

BOWS·ARROWS·MATERIALS

FINE BOWS and ARROWS
SELECTED RAW MATERIALS
5c Catalog—20 pages 5c
50c HAND BOOK 94 pages of illustrated instructions on making and shooting Archery Tackle—50c
L. E. Stemmler, Queens Village.N.Y

WILD BIRDS ADD *Charm* TO YOUR GARDEN

AUDUBON FEEDERS KEEP BIRDS IN FULL VIEW WHILE FEEDING
Feeders with and without squirrel guards, hanging and on pipe stands.
Write for our folder
audubon workshop
GLENCOE, ILLINOIS

It's WESTERN!

If you drink warm milk at the bar and wear lace on your shorts, you won't like Western Sportsman. It's a he-man's magazine about the New West—charging grizzlies, wily bucks, fighting trout, adventure, humor, etc. 7 issues $1. Special: 20 issues for $2.00. Sportsmen write: "Read one copy and you'll be a subscriber for life."
Western Sportsman, Dept. M, Austin, Texas

NEW SQUARE LAMINATED TUK AWAY

BUTCHER BLOCK of well seasoned kiln dried hardwoods—Ideal gifts—A handy chopping block for the home, ranch, camp, barbecue, club or market—

4 x 4 x 2	$1.50
8 x 8 x 3	4.20
10 x 10 x 3	5.40
11 x 12 x 3	7.20

Reg. U. S. Pat. Off.

At your favorite dealers or order direct

TEXAS MANUFACTURING CO.
12 H Street Brenham, Texas

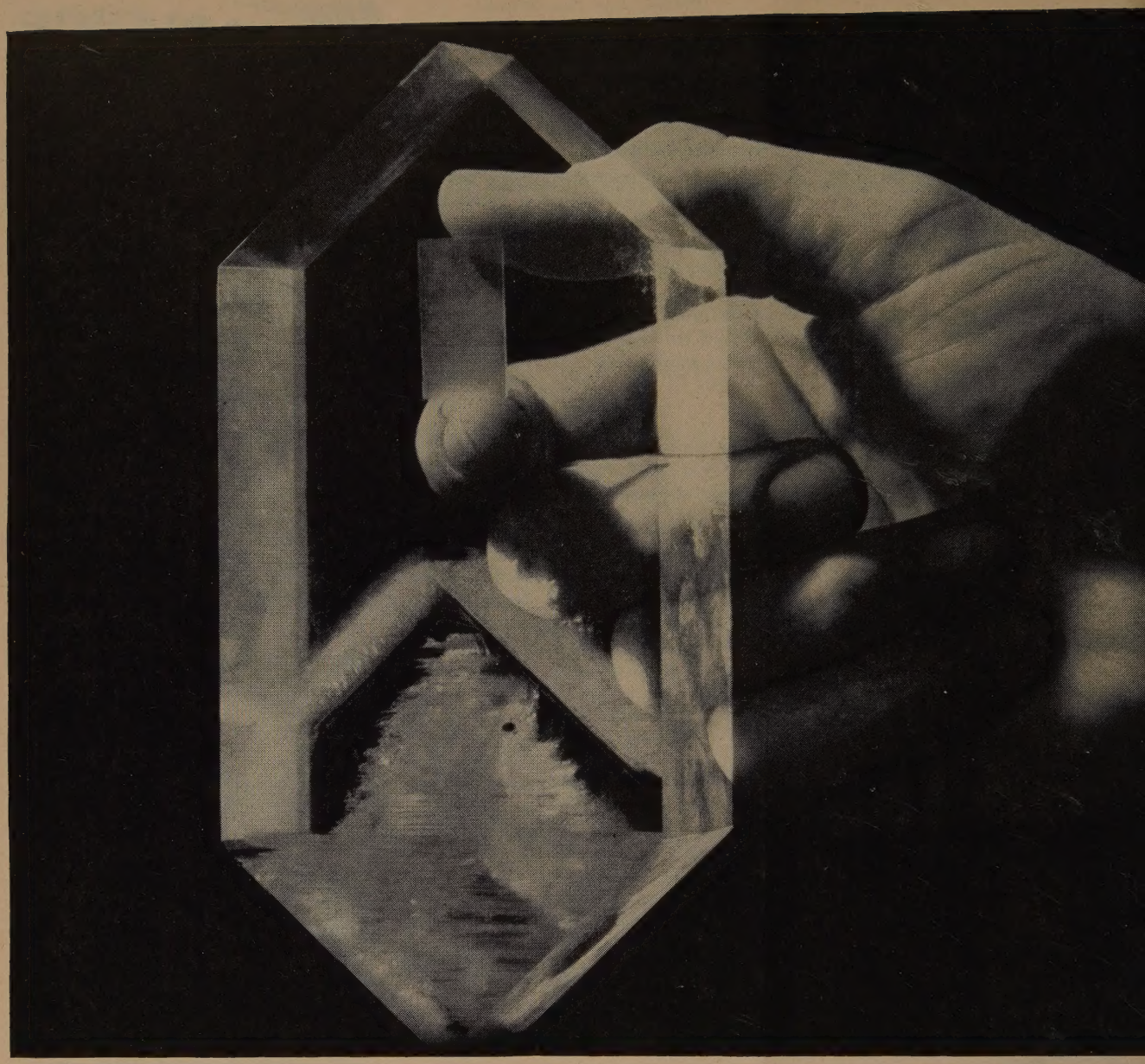
Tells How You Can Learn to MOUNT BIRDS!

Learn At Home

Men, Boys, Hunters, Fishermen, mount and save your lovely wild-game trophies. Be a Taxidermist. Mount Birds, Animals, Heads, Fish, Tan skins. YOU learn easily, quickly in spare time. Have a grand home-museum. The finest and the greatest hobby known, for sportsmen. Fun, real profits.

FREE BOOK

Yes. FREE. Beautiful strange, valuable BOOK, telling all about Taxidermy. Contains over 100 beautiful game-pictures. And it's yours FREE, if you rush your request. You can mount all kinds of wild-game, and common specimens too. We can positively TEACH YOU. So GRASP this opportunity. RUSH letter or postal for this amazing FREE BOOK. Don't delay. State your AGE.
N. W. SCHOOL OF TAXIDERMY, 2948 Elwood Bldg., Omaha 2, Neb.



CRYSTALS THAT GROW FROM A SEED . . . The large crystal is an EDT (*Ethylene Diamine Tartrate*) Crystal. It is started from seed (a piec the mother crystal) and revolved continuously in a solution. In three months it grows to the size shown. . . . Thousands and thousa of small plates, cut from the large crystals—then gold-plated and mounted in glass bulbs—are used in filters in Long Distance circu . . . By sorting out each telephone conversation from the others, they enable 480 conversations to go over one coaxial circuit at one ti

Crystals for Conversations

Many more Long Distance telephone coaxial circuits, in urgent demand, can be built next year because of Bell Laboratories research and development on synthetic crystals.

Plates of quartz are ordinarily used in the electric wave filters of these circuits.

But the demand has increased—the price has gone up—there will not be enough natural quartz available to build all the filters needed next year. The shortage is serious.

A long time ago, Bell Telephone Laboratories foresaw a shortage in quartz; hoped to find someth even better. They devoted years study to the physics and chemi of synthetic crystals. They now h one that can replace quartz in t phone filters. Western Electri now growing these crystals in factory.

Here again Bell Telephone L oratories' idea of making thi better at lower cost helps to you the best and most econom telephone service in the world.

BELL TELEPHONE SYSTEM

Contents Noted

JOINING with the Izaak Walton League of America, the National Audubon Society, the National Wildlife Federation, the Wilderness Society and the Wildlife Management Institute, the American Nature Association has collaborated in the production and distribution of two booklets dealing with two vital conservation issues—pollution and public lands. Describing the condition of our streams as a national menace, a booklet, entitled "The Pollution Problem", presents the whole question concisely, with recommendations for action. The other bulletin, entitled "Our Western Public Lands", presents the facts of the current drive to break down the public ownership of forest, park and grazing lands. Both subjects are of interest to all Americans. Copies of these bulletins will be mailed to members of the American Nature Association and readers of *Nature Magazine* for a three-cent stamp.

DRIVING through rural America, one cannot fail to note the drab and barren setting in which the little old red school house is usually found. Its grounds are almost always unplanted and innocent of any touch of landscaping. This is not surprising, since many rural sections lack funds for such adornments, and over-worked and under-paid teachers cannot undertake a beautification program. However, the National Garden Institute reasons that this situation does not need to prevail. It feels that a little cooperation in rural communities, some contribution of time and growing things by residents, would transform the red school house into something attractive to both pupil and passerby. So the Institute, which has its headquarters at 598 Madison Avenue, New York 22, New York, is making awards for rural school grounds improvement.

RESTORED Williamsburg has been one of our major enthusiasms since the wonderful work done there was completed. We have welcomed the opportunity to dash down to Williamsburg with visiting relatives and friends, and could do a creditable job of giving the talks presented by the attractive guides, although we would probably not do too well in one of the colonial costumes. Among the restorations is the reconstruction of more than fifty colonial gardens, planted with flowers and shrubs that made Williamsburg of two centuries ago famed for its gardens. One thing that seems to us most important about Colonial Williamsburg is that it is not a sort of museum piece but a living educational force. The restoration completed, the administration has not been content merely to sit back and let people come and see what has been done. Instead, there is an active educational program, as witness the annual Symposium on Gardens and Flowers of the Eighteenth Century to be held in January, to the delight of garden enthusiasts. Enrollment is limited, but Colonial Williamsburg, Williamsburg, Virginia, will be happy to supply details.

PREJUDICES are, we suppose, something we all possess, and we must admit to one strong one, which is in favor of Glacier National Park among the members of the National Park family. We were, therefore, happy to read of two gifts to the Glacier Natural History Association to be devoted to the purchase of privately owned land within the park for transfer to the Federal Government. One of these, a sum of $3000, came from Mrs. Frank R. Oastler of New York in memory of her husband, who was an ardent conservationist and one of the first white men to explore the Glacier Park area. The other gift came from Dr. George C. Ruhle, park naturalist at Crater Lake National Park, and with whom we climbed the peaks and rode the trails of Glacier when George was park naturalist there. Nobody loves Glacier more than "Doc", and a gift of $500 out of his none too fancy salary is vivid testimony to that affection. Like most National Parks, Glacier is plagued by the private land problem, and the Natural History Association is sponsoring a program looking to the solution of this problems in that Park through acquisition by gift.

SLIGHTLY hurt at the attention we gave the white squirrels of Marionville, Missouri, is Olney, Illinois, widely known as "The Home of the White Squirrel," whose albino population numbers some 650 animals, which are pictured on license plates, ornaments, stickers and otherwise. Sorry! R.W.W.

PHOTOGRAPH BY DEVEREUX BUTCH

The rain forest of the Olympic Peninsula is a forest of soft outlines, cushioned with moss, decked wit ferns and carpeted with oxalis. In all of continental United States there is no place like it, and this uniqu area has been preserved in the Olympic National Park, now threatened by the envious demands of lumbe interests that seek to log off the forest.

PHOTOGRAPH BY THE AUTHOR

Mount Olympus is the hub of the spectacularly beautiful area preserved in the Olympic National Park on the Olympic Peninsula in the State of Washington.

Our Olympic National Park—Let Us Keep All of It

By HERB CRISLER

"JOHN, get the camera! Isn't this marvelous!" John Clise and his family have just driven fifteen miles up the narrow, winding, mountain road and arrived at the Big Meadow on Hurricane Ridge. This is their first view of the rugged, snow-capped mountains of the interior of the Olympic National Park. From Hurricane, John and the family command a typical outlook in the Olympics—southward a wilderness of white peaks with the top of Mount Olympus, the highest of them all, showing beyond; northward, the blue salt water of the Strait of Juan de Fuca; and rising directly from Hurricane Ridge itself, Mount Angeles, which makes the most abrupt rise from salt water in the United States—more than 6000 feet within six miles of tideland. These Olympic Mountains are isolated. Far off to the northeast John can see the white volcanic cone of Mount Baker in the Cascade Range, cut off from him by unseen Puget Sound. To the north, the mountains of British Columbia band the sky with blue and white above the island-blotted straits.

Proposed eliminations of forest areas from the Olympic National Park are a threat not only to that Park but to the integrity of our whole National Park system. Although agreeing to cuts in the Park area of some 50,000 acres, the National Park Service has now withdrawn its approval of bills carrying this into effect. Actually the interests seeking to invade the Park covet 200,000 acres. Conservationists are aroused; see that your Senators and Congressman know how you stand.

The Olympics are peculiarly rugged. There are no plateaus. Craggy mountainsides rise to white peaks or needle-spined ridges and plunge into blue-green timbered abysses, in whose deepest crotches gleam white and green rivers, making the sprint from mountain to sea in thirty or forty miles. The gray, seamed hoofs of glaciers jut from sleeping snow-fields.

There are strange places where the ice has walked—old glacial cirques, taken over now by mountain meadow life, with lakelets, Alaska spirea, and heather among their white, glacier-combed rocks. There are wild and desolate ridges above the snow, with the Himalaya-like pile of Mt. Olympus itself filling a quarter of the sky; ridges where you find quartz crystals, and slate columns tilted and shorn off smooth as satin.

The enthusiasm of John and his family over the beauty they saw on Hurricane probably had more complicated and deeper roots than they realized. As they drove up the mountain road through dense forest, they had seen a buck deer in the velvet, a doe with her twin fawns, and, if they were extremely lucky, as a few are, a bobcat, or even a cougar and her grown kitten dissolving into the forest shadow. Up and up through tall, moss-bearded trees they had

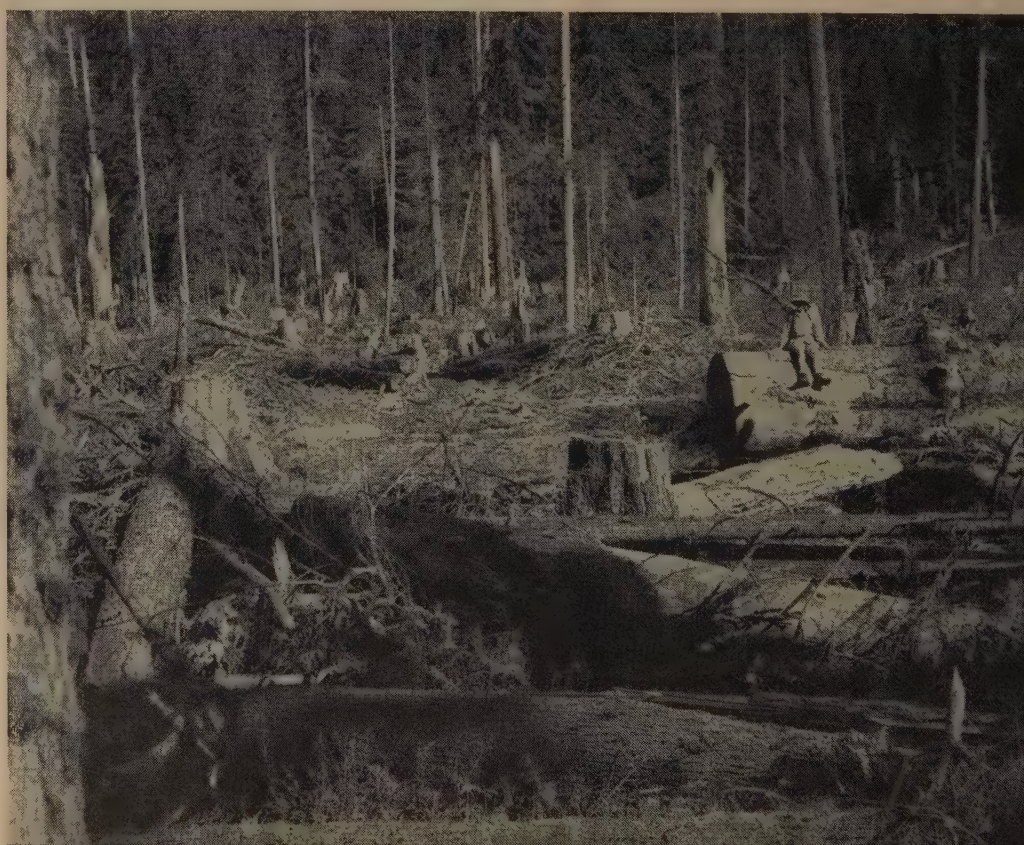
swung, until those gave place to symmetrical, pointed clumps of alpine fir, rippling their petticoats around them in dense circlets touching the ground. And as they came up into the open mountain meadow they heard the clear ringing whistle of the marmot—this biggest species of them found only in these and British Columbia mountains—and saw a brownish-tawny body vanish into the burrow near the road. On the tip of a silvery ghost snag sat a mountain bluebird, pure blue against the gray-blue sky. When they got out of the car, a horned lark flitted from a stone near them. The air was sweet with wild buckwheat. In the enormous sunny stillness they heard the peaceful little *yank-yank* of a nuthatch exploring some alpine scrub for food.

Of all these things the Clises were aware, without consciously realizing that such details heightened the beauty of the scenery. The visitors had driven up through—and stepped from their car into—a going concern. Instead of being herded between the ropes through a historical mansion, the Clises were delighted intruders in a living home, with wild creatures all around them going quietly about their business. The ingratiating charm that made Mrs. Clise call for the camera was nothing she would ever photograph, for it sprang from this "family feel." That is the special characteristic of the Olympics. They are not a spectacle only; not vacant scenery. They are a living home; a biotic community.

When the Clises came up it was early summer, and at this time the animals are found in the high country. Over the passes and down the fields and fingers of snow wallows the black bear, his coat gleaming. Now and then he flops calmly upon his rump and coasts a few yards. Oblivious to the world, a barren female bear inches into a bright, tender-green scrap of meadow, biting the crisp stalks of avalanche lilies. Their white stars stick out from the sides of her jaws. Footprints rumple the black mud sides of a game wallow in a pocket. Up in the mist, among alpine scrub, a buck deer raises his antlers to listen a moment, his fawn-colored summer coat and furry antlers thickened with mist drops.

Higher still, under low gray clouds that cut off the peaks on a mountainside dull and rich-colored with patches of reddish huckleberry shoots among the greens, browse big, warm-colored tan and brown bodies—crowned heads all—six bull elk in the velvet. Around wet, steep, gray talus banks above snow fingers in the ravines, their tracks are trampled, and across the snow that is breaking dangerously away from the banks now, and opening blue holes to the roaring stream and black boulders ten feet below. It is the time of the bachelor's clubs in the high country. But down in the Low Divide three cows, each with her sharp-hoofed calf, have trickled together, each from her solitary maternity ward still lower toward the river-bottom, and are heading slowly to the high country to form the herds again. Each cow has a curiously Parisian, clothed look because of her brown hood and cape above her demure tan body with the cream-colored rump-pad.

Elk signs—from this spring, from last fall, from last century—fill the high country with interest. Here is a freshly trampled "bedroom," the cradle of flat earth on the up-mountain side of a grove of alpine fir. There the bulls lie down during the middle of the day, each pair of antlers curved around an invisible sphere of air. Over there are small dead firs with their bark scrubbed off in last fall's challenging season. Here is the broad, half-used contour of an ancient elk trail. Once these elk ranged the mountains in herds



The Bogachiel has been logged to the Park line. Here we see the results of typical Olympic Peninsula "selective" logging, synonymous with "fall all and select what you want." Here is waste left from logging operations three years ago. The large log of spruce on the right is sound and contains more than 5000 board feet of lumber, but it contained one burl so was left to decay.

PHOTOGRAPH BY THE AUTHOR

of one hundred to often as many as three hundred.

This is an inadequate picture of the Olympic National Park, a biotic community that is now being threatened by bills before Congress that propose the reduction of the Park, legislation that could well lead to the complete destruction of the biotic community.

In order to maintain a year-round biotic community the animals must have winter quarters at lower elevations, as well as a summer home in the mountains. The winter quarters inside the Park now are sufficient to maintain the life cycle, but are just on the borderline. The area of the Olympic National Park is some 852,000 acres. The bills propose the "elimination" of 56,000 acres, mostly on the Calawah and Bogachiel Rivers and some on the Hoh, Queets, and Quinault Rivers on the west and south sides of the Park. Actually the goal of the interests seeking to grab the timber is more than 200,000 acres.

The reason why these last few acres down the rivers are so important is that the valleys in the Olympics are mere canyons at their head, becoming larger, like funnels, as they progress out of the steep mountains. It is not on the mountainsides but in these narrow, flat river-bottoms that the elk do most of their winter browsing. Quite often the lower mile of river-bottom will contain twice as much acreage available for winter feeding as will the mile above. The winter weather conditions become more severe the farther up the river one goes. Elk make their way down out of the snow if possible. In severe winters that last mile may save the entire herd.

The proposed elimination would be turned back into National Forest, where it would be open to logging and hunting. As the hunting season opens, into the Calawah area, just north of the present debated Park line, crowd scores of hunters, praying for bad weather to run the animals down out of the Park. Two years ago the loggers at one Calawah logging camp laid off on the opening day of the season and annihilated one entire herd of elk. In the same area one very small group of hunters exterminated all bulls with a certain herd except for one spike. The so-called straightening of the Park boundary lines on the west side would eliminate for the elk the last bit of refuge from hunters in this Calawah section.

But the condition is most serious on the Bogachiel River, for the Bogachiel herd is one of the most interesting tourist attractions of the Park, in summer ranging in the Bogachiel Peak, Hoh Lake, and Seven Lakes Basin country, one of the much visited parts of the Park. This herd is likely to become extinct if the proposed seven-mile cut is allowed on the Bogachiel, and still more so if the fifteen-mile cut already demanded by the timber interests is allowed. The Roosevelt elk, the largest and stateliest of American elk, is a unique subspecies, found only in the Olympics, except for about two hundred individuals in Oregon, whose survival is problematical. The proposed "eliminations" in their winter range will contribute to cutting the herds down to bare survival if not extinction.

The local objections to the present size of the Park (about 38 percent of the size of Yellowstone) are based pretty much on selfishness or on petty peeves. First, of course, there are the timber interests, seeking the profit in virgin timber; then come the sportsmen, who want to hunt inside the present Park boundary; then the predatory-animal bounty-hunters who used to hunt cougars and wildcats inside what is now the Park; finally one even hears from some of the local mountain climbers, who complain that the trails are not as well kept as under the Forest Service, a fact due partly to the present economy program.

Bull elk in the spring work their way up to the high country, which is their summer home. The proposed raid upon the Park area would bring destruction and hunting to an area that now supports the Roosevelt elk herd, unique sub-species that would face extirpation with the invasion of their native haunts. Hunting being forbidden in the Park area, these animals are now safe from destruction.

PHOTOGRAPH BY THE AUTHOR

But these Park opponents are encouraged by those who will benefit financially from the timber cuts.

Also there are, inside the Park, on the proposed cuts, a very few farms, most of whose owners have to supplement the income from these rather border-line-type farms by working on trails, logging, or acting as fire patrols or guards. Many of them would be better off if their property were condemned and taken into the Park, instead of the Park being shrunken on their account. For, after all, these few farmers, like the other local objectors, are only the timber interests' lever or pry to get the timber out of the Park.

There is plenty of timber available on the Olympic Peninsula, outside the National Park, to keep the present industries running indefinitely on a sustained yield basis, provided the plywood companies will convert to small logs. But the reason for wanting the virgin timber from the Park is that it would give the plywood companies large peeler logs for making plywood of superior quality, thus giving them a market advantage in competition with eastern companies, which already use smaller logs. However, if they had all the timber in the Park, it would run them only approximately ten years. The vast bulk of Park timber is un merchantable, consisting of smaller trees on stee mountainsides. But the Department of the Interior originally proposed eliminations were pretty ob viously an attempt to appease them with a "bone of 6½ percent of the total Park area, and this entir "bone" lies down in the rich "rain-forests" on th west and south sides of the Park. The appeasemen would be highly temporary. Already loggers are de manding 7½ percent of the Park area, bearing th finest 14 percent of its Douglas fir.

Two misleading phrases are used—"over-ripe tim ber rotting inside the Park," and "selective logging. The two main characteristics of "rain-forest" are th deep, jungle-like curtains and capes of tree-moss an the conspicuous rooting of trees on logs. Rotting tim ber is Nature's method of producing the giant tree of the "rain-forest." They grow on the decayed bodie of big trees, centuries old, which in turn were nou ished on earlier giants. (Continued on page 496

At the left is a trail and some of the trees on th Bogachiel section threatened by the propose eliminations. We cannot afford to "sell samples of such forest. Below is a bit of the rain forest o the Hoh River region, also threatened at th moment.

PHOTOGRAPHS BY THE AUTHOR

A platypus poses, showing graphically why it is often called the duck-bill. In addition, the animal has webbed feet, the fur of a mole, the tail of a beaver, the spur of a cockerel, the poison and eggs of a snake. The eggs are about the size of pigeon eggs, usually laid two at a time and sealed in the nest so that there is no ventilation during the hatching period. The nest burrow is sometimes as long as one hundred feet.

The Platypus at Home

By ALEC H. CHISHOLM

AUSTRALIANS are pleased and amused—maybe sympathetic as well—over America's interest in the platypuses that the authorities of the animals' homeland permitted to be sent the New York Zoo. These mixed feelings arise from the fact that we have been, as it were, in the same boat many times. Ever since the platypus first became known, 150 years ago, it has been springing surprises. It has been in the news more often than any other Australian mammal, large or small—and that is no light performance in a continent that ranks as a "land of living fossils", or a zoological deadend.

White people had been in Australia only a few years when they encountered platypuses in streams near the infant settlement of Sydney. Naturally, they did not know what to make of the queer creatures. Here were oddities that combined the characteristics of mammal, bird, and fish. How were they to be classified? The settlers let the matter rest by talking loosely of "duckbills" and "water-moles".

Museum specimens reached England soon afterwards, and there some scientists refused to believe them—they suspected that a furred creature with a duck's bill and webbed feet was a fake of some kind. However, the genuine nature of the oddity became established in time, and after further argument the names *Platypus* (Gk. broad, flat) and *Ornithorhynchus* (bird-beaked) were bestowed on what was recognized as a very ancient form of mammalian life.

Reports that the platypus laid eggs arose at intervals in following years. Controversy on the point raged intermittently until as recently as 1884. In that year W. H. Caldwell revealed definitely that both the platypus and its cousin, the echidna, or spiny anteater, laid eggs.

Caldwell, then a bright young English zoologist, —he died in England five years ago at the age of 82 —visited Australia especially to study the reproduc-

tion of monotremes (platypus and echidna) and marsupials, and established himself in the Burnett River district of Queensland. In that lonely spot he made his discoveries and decided to announce them right away. He wrote a message, "*Monotremes oviparous, ovum meroblastic*", and sent it to a neighboring ranch, where it would be gathered by the passing mailman. The message was addressed to Sydney University, and Caldwell asked that it be sent to the British Association for the Advancement of Science, then sitting in Montreal.

This was done. The dramatic nature of the message took the conference by storm. Until recently there were men who attended that gathering of sixty-odd years ago and who remembered what a sensation was caused when Caldwell's message arrived from the wilds of Australia.

Because the soft-shelled eggs of the platypus are laid in a nest in a well-hidden burrow in the bank of a stream, few people have seen them. One man who became an authority on the subject, and who elucidated many problems associated with the platypus, was an ex-actor named Harry Burrell. Although untrained in zoology, Burrell had a keen research mind, and when he married the daughter of a country property owner in New South Wales, and there began to watch the life of the streams, he worked to such stout purpose that he eventually became Australia's "Platypus Man", achieved a hefty book on his subject, and was awarded the honor of the Order of the British Empire for his services to zoological knowledge.

It was Burrell, the former comedian, who stole all manner of secrets from the platypus; who discovered that the eggs take about a week to hatch and the young remain in the nest for about six weeks; who learned that the senses of sight and hearing are subordinated or completely eclipsed when the animal is below water (so postulating a sixth sense), and who, among other things, first kept the platypus

In the platypusary at the Healesville Sanctuary in Victoria, this platypus, "Betty Hutton," scrambles out of the water to eat from the grub-filled hand of David Fleay, who accompanied this animal and two others on the trip to the New York Zoo.

successfully alive in captivity

It was also Burrell who wa back of the first successfu attempt, in 1922, to lan platypuses in America. H provided five male specimens together with instruction regarding feeding, and thes Ellis Joseph, an animal deal er, took on the trans-Pacifi voyage. Four died durin the journey, but the remain ing example of "the world' most wonderful mammal caused "the spell of ten thou sand years" to be broken b living in the New York Zo for forty-nine days.

Further evidence of th widespread interest in th platypus was furnished b "Splash", a friendly an playful animal that Rober Eadie, former Director o the Mackenzie Sanctuary a Healesville, Victoria, kep in a special enclosure—th kind of contraption tha Burrell termed a "platypus ary"—for rather more tha four years. In that perio Splash attracted approx mately 12,000 visitors, repre senting every continent. As result, when the animal die in March of 1937 the volum of letters and telegrams o sympathy that reached M Eadie was worthy of a popu lar human being. A most en gaging little fellow wa Splash. But, like all of h kind, he had an expensiv appetite; in four years he ate three-quarters of a to of worms, two hundred dozen eggs, and thousand of tadpoles.

There you get the woman's touch. It was Mr Eadie who discovered the high value of the egg-di to a platypus. Close study of the animal convince her that it would not live for any length of tim unless it had a balanced diet. Her belief was born out by the liveliness of Splash, and has been su ported, too, by the latest hundred percent success the transport of three platypuses to America.

It was another fortunate circumstance for Mr. Ead to discover that Splash took kindly to being rubbe and tickled with a mop. That article became t platypus's chief plaything; you could almost he him gurgling with delight as he clung to it with

our feet. Indeed, it seems robable that the mop was a actor in prolonging Splash's ife; certainly it was a chief nfluence in persuading him o frolic in front of visitors. Possibly New York would be vell advised to cultivate some practice of the kind.

Only once did Splash become dangerous. Becoming peevish over something, he struck at a man's hand with one of the poison-spurs that each male platypus has on each of its hind legs. Had that strike connected, the owner of the hand would have known all about it for quite a while, for the poison stored behind those spurs of the platypus is equal to a mild snake-venom. It has not caused any deaths, but it has given various victims a pretty bad time for a week or so.

Eadie's success with Splash made clear that it was possible, with proper care, to keep the platypus in captivity for an indefinite period, a point that had been doubted by many people. In particular, Mrs. Eadie's discovery of the value of eggs beaten into a custard had eased the food problem, which had sometimes been acute when earthworms went into retirement.

That is not to say that all troubles in the matter of keeping platypuses had been solved. David Fleay, who took over as Director of the Healesville Sanctuary when Eadie retired a few years ago, certainly had the benefit of the researches of Burrell and Eadie, but he had many problems to face in making available a number of the animals for display purposes. Combating those problems, he caused one of his charges to break Splash's record as the longest-lived platypus in captivity.

Also, Fleay was instrumental in causing platypuses to "fly". Because the queer little creature occurs naturally only in streams of eastern Australia—from Tasmania to the lower north of Queensland—the Government of South Australia decided to improve upon Nature by introducing some to the waters of Kangaroo Island. Asked to supply specimens, Fleay hunted streams at night (the platypus is largely nocturnal) and caught five pairs; and then he tended them for six days—in which time they ate 7000 worms and 250 land yabbies or crayfish—after which, starting out at 4 o'clock in the morning, he motored them 45 miles to a waiting aeroplane and personally saw them "take to the air" on their 600-mile journey to their new home.

Showing the various parts that make up the strange combination that is the platypus. The webs of the feet are not fastened to the claws but are thrown back when the claws are used for digging. The webs are used only for swimming.

The next achievement was the breeding of the platypus in captivity. This was accomplished at the Healesville Sanctuary, rather more than three years ago, through the medium of a pair named Jack and Jill.

Jill had been found as a furry babe, able then to fit comfortably into a hand, wandering along a mountain road in the summer of 1938. Maybe she had wandered from her nest-burrow and was picked up and then dropped by some mammal or bird of prey. Anyway, she took kindly to a ready-made home, and, within six years, had grown into a fine lady sixteen inches long (a trifle below average) and two pounds in weight. Jack, her mate, was a refugee from a bush fire. He, too, prospered in the Healesville platypusary, and eventually became twice the weight of Jill.

In the winter of 1943 Jill hibernated for several days at various periods. At such times she "pugged", or blocked up, her camping chamber from its connection with the water, just as platypuses do in their free state. In springtime the two animals were seen to be courting, and soon afterwards, when dry leaves and grass were introduced to the platypusary, Jill began transferring these into a compact bundle gripped by her tail and carrying the material into her chamber. Not until midsummer was the nest disturbed, and then, the chamber being carefully opened, a baby platypus nine inches long was revealed. The infant was estimated to be eight and one-half weeks old, having been hatched from the soft-shelled egg as rapidly as the tiniest bird.

That baby was christened Corrie. Its fame spread throughout the world. Now Corrie is a robust platypus, rather past the flapper stage and a trifle larger than her mother; and all (Continued on page 496)

Stanley Clisby Arthur, executive director of the State Museum in New Orleans, studies the Locke Breaux Live Oak, president of the Louisiana Live Oak Society. This oak has a spread of 172 feet and grows on the west bank of the Mississippi, thirty-five miles above New Orleans. Dr. Arthur recently revived the Live Oak Society, and its pictures and records are preserved in the Cabildo on Jackson Square.

Louisiana Live Oaks

By ROBERT H. HARPER

Photographs by Stanley C. Arthur

As distinctive of Louisiana as the pelican on its seal is the live oak of the coastal region. Although an irregular line of live oaks marches across the North American continent, nowhere else do individual oaks equal the largest in Louisiana.

Only live oaks, "known or suspected to be more than 100 years old," are admitted as members of the unique Live Oak Society of Louisiana. The dues of twenty-five acorns a year, required of each member, are used to propagate their kind. These acorns were formerly planted in the nurseries of Southwestern Institute at Lafayette, Louisiana; later arrangements were made with Felix Seeger, general superintendent of the New Orleans Parkway Commission, to plant the annual dues in a special plot, the seedlings to be distributed throughout the State. The Society was founded in 1935 by Dr. Edwin L. Stephens, a native of Louisiana, who was the first and long-time President of Southwestern.

Dr. Stephens was the only human member of the Live Oak Society; each tree enrolled, however, had a human sponsor who watched over the tree and sent in the annual dues in the autumn. For seven years, following the death of Dr. Stephens, the Society was dormant. On Arbor Day, 1945, the organization was revived under Stanley Clisby Arthur, executive director of the State Museum in New Orleans, and its pictures and records placed in the Cabildo on Jackson Square. In the last published list by Dr. Stephens there were 57 live oaks included in the Society. The revised list of Mr. Arthur includes 119 trees in the membership. A small proportion of these are in adjoining states.

The Locke Breaux Oak, thirty-five miles above New Orleans on the west bank of the Mississippi, standing near the river road on a plantation recently acquired by A. M. Barnes of New Orleans, is the president of the Live Oak Society. Its girth, four feet above th ground, is 35 feet and ten inches, its height 101 fe and its spread 172 feet. The Arnaud Robert Oak the Teche, measuring 34 feet and nine inches, is th vice-president. Each of nearly fifty of the Socie members measures more than twenty feet in circu ference.

The live oak is an evergreen. Its texture seems a most like steel. Once when a West Indian hurrica roared up from the Gulf of Mexico, the writer ve tured on the porch of the Wesley House in Houma watch several live oaks, in the lightning's gla wrestling with the storm. Like the writhing tentacl of an octopus, the stalwart branches were swaying a bending but never breaking. While other trees we being uprooted, or badly mutilated, hardly a twig the live oaks was blown away. The charm of the trees is found in their huge size, wide-spreadi boughs and beautiful symmetry. The lower branch sometimes as large as trees of other varieties, reach o horizontally forty or fifty feet from the immen trunk and often touch the ground. The entire t gives the impression of great strength and the stami

e la Ronde Oak Alley, double row of live oaks onnecting "Versailles", plantation home, with ne Mississippi River anding. They were set ut by Pierre de la Ronde II on April 20, 1783.

o stand through all the inds that blow.

General Edward Pakenam, British commander n the Battle of New Orans, died of wounds under the shadows of four ive oaks at Chalmette. In nemory of the dead they bear the General's name. A short distance down the Mississippi from Chalmette, one of the grandest avenues of trees in the world leads a half-mile from the river to the ruins of the Versailles Plantation manor. The live oaks of the avenue were planted 164 years ago, on the twenty-first birthday of the plantation heir, Pierre de la Ronde. The rows of trees are about 150 feet apart, but the higher branches meet in a mighty arch overhead, like that of some great cathedral.

Audubon and City parks in New Orleans owe much of their beauty to the splendor of their live oaks. In the older section of Audubon Park an avenue of oaks leads to the site of the Horticultural Hall, wrecked in 1915 by a tropic storm and never rebuilt. Man's work perished but the live oaks remained. Some years ago, during a triennial convention of the Protestant Episcopal Church, an open-air service in Audubon Park began with a colorful processional under the shadowing live oaks of the long avenue, in which were the bishops from all parts of the United States and other countries. Elsewhere in Audubon are two of the largest live oaks known—George Washington and Martha Washington, the former twenty-eight and a half feet in girth and the latter a foot less. City Park has several oaks only a little smaller than the Washington pair. But a greater attraction is a grove of smaller oaks, the Duelling Oaks, under which affairs of honor were decided in Colonial days.

Across from City Park is a pretty cottage with a big live oak standing *in* its front. So large a tree could not have grown up through so new a house. Instead, the owner built the house to include the tree, and it stands up through the porch to lift its sheltering arms, with their cool shade, over the entire cottage.

Live oaks throughout New Orleans, notably along St. Charles and Napoleon Avenues and in new sections once plantations, make the metropolis of the South a city of live oaks. Along Esplanade, lower limit of the original city, double tracks brought cars so near the oaks of the neutral ground that screens were placed at the windows to protect passengers from possible injury. The proposal to remove the trees stirred up a heated controversy.

Along the Teche, winding through the Evangeline Country, the live oak is a common sight. More than five thousand have been counted along the Old Spanish Trail from New Orleans to Lafayette, a distance of 170 miles. In a great bend of the Teche above Franklin, Oak Lawn Manor gleams white through acres of live oaks. A

The vice-president of the Live Oak Society is Arnaud Robert Oak, growing six miles above Breaux Bridge, Louisiana, near Cecilia on the Teche. It has a spread of 121 feet.

An important member of the Society is the Luling Oak, which has a spread of 102 feet.

steamboat captain, plying up and down the broad bayou, resolved to be "lord of the manor" some day. His dream was realized. Grown wealthy, he acquired the estate, restored the house to its former grandeur, hung its walls with rare tapestries from Europe, and welcomed visitors who came to see it. The grounds needed little but improved walks and roadways. The years long gone had adorned them with stately live oaks of outstanding beauty.

At St. Martinville, mentioned in Longfellow's poem, is the Evangeline Oak under which the Acadian maiden watched for her lover. Not large for a tree of its kind, it has the true form and spreading habit. Townspeople say it is not the original oak, but a shoot from it. This would account for its medium size. Oak Alley, a few miles above St. Martinville, closely rivals the De la Ronde Oaks. It leads fully a mile from the highway to the home on a large plantation. Its live oaks alternate with tall pines, exotic to the section.

In Lafayette, a city of 25,000 on Bayou Vermilion, which in its lower course attains the size and name of river, are two magnificent live oaks—one at the gateway of the Protestant cemetery and the other on the grounds of the Catholic cathedral. The Cathedral Oak has a girth of nineteen feet and is beautifully symmetrical.

On beautiful False River, so named because it was once a channel of the Mississippi but is now a broad, clear lake, stands the Maryland Oak, near which James Ryder Randall wrote "Maryland, My Mary land." Young Randall had come from Baltimore t head the department of English and Literature a Poydras College, three miles west of the town of Ne Roads. On the afternoon of April 26, 1861, he learne of the skirmish between citizens and Federal infan try marching through Baltimore. That night Randal southern in his sympathies, could not sleep. At las about midnight, he arose, went to his desk and wrot what became one of the great battle songs of th Confederacy. Seventy-one years passed before th place where the song was written was marked. In 193 a slab of granite, with a bronze commemorative plat inset, was erected beside the oak by the Pointe Coupe Book Club.

Off the main lines of travel, at the village of Elme in central Louisiana, is a remarkable live oak, sol tary and alone. A perfect cone of deep green, th trunk and branches can hardly be discerned, for th foliage touches the ground all around. During the wa the road through the village was hard-surfaced as link between two training camps, and many G. I. Joe must have seen the singula tree—like a mighty bee-hiv painted green.

At Grangeville, near th State Capital, is another sol tary oak of medium size. A though it is recorded that th celebrated Lorenzo Dow die in Georgetown, D. C., and th writer has seen a slab to h

(Continued on page 496)

In Audubon Park, New O leans, is the Martha Was ington Oak, which, with th George Washington Oa nearby, is one of the large live oaks known.

The Romance of Spices

By ANDREW S. WING

Drawings courtesy of the Public Service Company of Northern Illinois; photographs from the American Spice Trade Association.

LITTLE brown buds of a fragile tree of the Moluccas, the peeled bark of a tree of Ceylon, berries of a vine of the East, hard seeds of a tree of the spice islands of the Netherlands Indies, played an important part in fashioning the politics and economy of the world. They made history, too, for these are all spices—clove, cinnamon, pepper and nutmeg—that, with others of their kind, changed the map of the world, made maritime empires and set explorers and adventurers on their voyages. Theirs is a story of romance, not unmixed with battle and bloodshed.

Magellan's second in command, Captain del Cano, brought back a fortune in pepper, was knighted by the King of Spain and given a spicy coat of arms of nutmegs, cloves and crossed sticks of cinnamon.

Just when and where spices were first discovered and used is uncertain, but cinnamon and cassia, probably the most ancient, find mention in a Chinese herbal of 2700 B.C. Black pepper, saffron, mustard, ginger, clove and turmeric are also ancient in use. Found in the East, they enjoyed favor there first, knowledge of them slowly spreading until their rarity and use by the rich and noble sent man out on the uncharted seas in search of the lands of spice.

Until the fifteenth century, when exploration grew to important proportions, the people of northern Europe had grown and used herbs for seasoning and in medicine. Spices were beyond the means of the general public, which seasoned its food largely with salt. Unrefrigerated meats, hung for months, were usually almost strong enough to walk off the hooks, and one of the first uses of spice was to disguise the odor and taste.

The Chinese, pioneers in so many good things, were, however, trading with the natives of the Malay Archipelago for pepper, cinnamon and cloves more than four thousand years ago. The Egyptians used spices of various kinds in embalming the mummies of their kings. Perfumed oils were employed in ceremonies by the Jews, and incense and perfumes made from pine resins are frequently referred to in the Bible as frankincense and myrrh. These peoples, however, bought most of their supplies from Arab traders, who cannily kept their source as a dark, deep trade secret. Indeed, to throw possible rivals off the scent, the Arabs spread dour rumors about the monsters that guarded the mysterious lands whence came their precious cargoes by sailing ships and camel caravans.

It was the Venetians, shrewd and able seagoing merchants, who first exploited the European market for spices. During the Crusades of the eleventh cen-

Egyptian inscriptions record that the none too fragrant populace had to douse itself with perfume at least once a week, forerunner, perhaps, of the weekly bath.

Law in olden China required that a lowly courtier slip a clove in his mouth before an audience with his sovereign lest he offend that worthy.

In the Middle Ages "pepper rents" required each tenant to provide his lord periodically with a pound of pepper. A pepperers' guild existed then.

A native of the Netherlands East Indies, the land of spices, holding a tray of cinnamon. On the ground are, in the top tray, mace; center, cloves; bottom, nutmeg.

tury, these profit-loving people ferried the armies of holy pilgrims and knights across the Mediterranean to Palestine. The empty holds of their ships were filled on the return journey with cargoes of pepper, cloves, cinnamon and other spices. Venice was the leading maritime nation of the world in those days. Wealth accumulated from the traffic in spices, silks and other prized oriental goods served to build that city into a center of power, culture and beauty. Paintings, sculpture, architecture and other art treasures of that golden era mark Venice as a city apart, even today—all derived, directly or indirectly, from the golden ducats of the spice traders.

This, however, was too good a thing not to invite competition. Other Italians, and Spanish, Portuguese, French, Dutch, and English, envied the good business enjoyed by the merchants of Venice, and decided to get their share of it by hook or by crook. The Venetians were merely carrying the goods across the inland sea to and from their home port and Alexandria, Acre and other eastern cities. Spices were bought from the Arabs, but whence they came only the Arabs knew, and they would not tell. Years before, Marco Polo had journeyed overland to China, and the stories he told on his return of the wealth of the Indies were so fabulous that nobody believed them until years later when his truths were found to be stranger than fiction.

Logic suggested to envious traders the need for direct contact with the Spice Islands, or wherever it was that the pungent cargoes came from. Since the Red Sea and the desert routes were guarded by jealous Arabs, some other way had to be found. It was Prince Henry, fourth son of King John I of Portugal, known today as Henry the Navigator, who broke down the deep-seated fears and superstitions about the route to the Indies. Until his death in 1460, he worked day and night for more than forty years on the project of finding "the way to the spices." Realizing that men must be educated not to fear the unknown waters, he developed a navigation center for scholars, map makers and explorers. Larger ships were built and sent down the west coast of Africa, not far enough to round the Cape but far enough to prove that the old fears and superstitions were just so many sailors' yarns. When Prince Henry died, the minds of men were tempered to the idea of the great explorations that were to follow.

Eventually the Cape of Good Hope was rounded, and one route to the Indies was opened up. Columbus, trying for a shorter route, discovered the West Indies and the American continent, and then was jailed in Spain because he had not found the Spice Islands after all, although he died believing that he was near them. Vasco de Gama and the Englishman John Cabot made a dash next to see who could get there first. De Gama made it, and returned after twenty-six months but actually he never found the islands where cloves and nutmegs grew. That honor probably belongs to a Venetian named Nicolo Conti, who actually found the Moluccas, a small group in the Indian Archipelago whereas de Gama only reached the west coast of India. That was almost as good, however, for he was able there to lay in a large store of cloves and nutmeg from the Moluccas, pepper from India, cinnamon from Ceylon, camphor and ginger. But the Arabian traders still were the middlemen on the Molucca spices.

Those were great days for Portugal, and she soon waxed fat from the East Indian trade and from her American conquests. Last and greatest of all the voyages of that time was the circling of the globe by Ferdinand Magellan. Unable to obtain support from Portugal, he changed his allegiance to Spain, and, in September, 1519, sailed west from Seville into the unknown. He was determined to explore the waters west of the Americas and "to reach the East by going West." Magellan rounded Cape Horn and reached the island of Cebu in the Philippines, where he was killed in a fierce battle with natives in April, 1521. By the time the expedition, now in the command of Juan Sebastian del Cano, reached the Moluccas in November, there was only one ship left, but that safely made the home port on September 20, 1522. Only eighteen men returned out of a total of 265 who had started but they were heroes and they had spices in their hold direct from the islands where they were grown. This single cargo paid a profit over the entire cost of the

Close-up of pepper corns. They grow in clusters, each cluster forming a long, slim spike. The pepper plant is a vine, often trained to grow on tall poles

expedition, and it greatly enhanced the glory of Spain.

Rivalry for the spice trade was great. Portugal's monopoly was lost to the Dutch, who finally got the foothold in the East Indies, forming, in 1602, the Dutch East India Company, which promptly proceeded to exploit the Spice Islands. Meanwhile the British East India Company had been formed in 1600 by Queen Elizabeth to exploit the Far East.

The story of this early struggle to dominate the Indies is fascinating but gruesome. Read in the light of recent events in India and Java, it explains much of the desire of the brown and yellow races for freedom. Their hatred of their white masters is old and deep. A popular book on the subject is *Spice Ho!*, by Agnew Danforth Hawes, published by Knopf.

The English and Dutch finally came to an understanding; the Dutch were to keep the Spice Islands while the British were to control the mainland. The most productive groves of clove and nutmeg trees were found to be on the islands of Ternate, Ambonia and Banda Island. These the jealous Dutch guarded like hawks. Soldiers were imported; men were encouraged to bring their families to help colonize the islands. In that wise policy lies the strength of the Dutch today.

Gradually the British and French increased their holdings. The British had India, where pepper and cinnamon grew, but the Dutch clung to their monopoly of nutmegs and cloves. No one else could obtain seeds or trees to plant. Eventually, however, the French and British sneaked out trees and seeds of both nutmegs and cloves, and the French found that these would grow beautifully on their islands near Madagascar, while the British planted theirs on Penang off the Malay Peninsula. Now Penang ranks fourth in the world supply of cloves, while Madagascar (French) and Zanzibar (British) are tied for first place. The Dutch monopoly was broken at last.

Today it is different. Except during World War II, we have had an abundance of pepper and all the other spices that we need, and at moderate prices. The American Spice Trade Association confirms this. This association, forty years old, makes its own laws, regulates its own industry, keeps all the spice importers, jobbers and grinders in line. If a dispute arises about a deal, the decision of the arbitration board is final. No lawyers; no court disputes are tried in public. There are close to 200 members of this unique organization, all nationalities but with a strong sprinkling of Dutch names. The standard contract of this association is all the law needed. How different from the olden days!

In medieval England one of the earliest guilds was the Pepperers, first heard of in 1180. This was succeeded by the Grocers' Company who were literally men who sold in "gross" rather than at retail. At that time spices were high, indeed. A pound of ginger was worth more than a sheep, pepper cost $4 a pound, and cloves were worth more than $20 a pound. Black pepper today is worth $.32 a pound, ginger $.135 and cloves $.14 a pound. In olden times pepper was used for (Continued on page 500)

Native boys of the Netherlands Indies debarking a cinnamon tree to get strips of the spice as we know it.

What Is New in Meteorology?

By EDNA HOFFMAN EVANS

Photographs from U. S. Army Air Forces

★

To spot storm centers in advance, and to help airplane pilots to avoid them, two radar devices have been developed. One of these is "Little Abner," shown at the right, and a height finder. This odd-looking affair is used in connection with the "Mew," which sounds catlike but is short for Micro-Wave Early Warning. This device has a range of about two hundred miles. Working together, these two developments can guide fliers around bad weather areas and help them to avoid mountains and other obstacles and even bring pilots and their planes in safely when ceilings are low.

"WHAT'S new in meteorology today?"

The Weatherman grinned and scratched his head. Being a patient man, accustomed to dealing with statistics (which take a great deal of patience), and with the general public (which takes a great deal more), he has heard and answered plenty of silly questions in his day.

The implied demand that he pull a brand new and startling meteorological discovery out of his hat did not surprise him in the least. He was ready for it. Immediately he proceeded to collect, from various drawers and shelves in his office, publications and data that could answer graphically, and in detail, the query, "What's new in meteorology?"

It is surprising the number of new secrets that various researchers and organizations can wring from a natural force as old and omnipresent as the weather. After all, weather is an endless procession marching across the face of the earth—sunny days and cloudy ones, fog, rain, drought, hail and snow, balmy spring breezes, tempestuous summer thunderstorms, autumn frosts and howling winter blizzards—all these, with an occasional tornado, typhoon, hurricane, flood or other disturbance thrown in for good measure. The procession never ceases. Only the arrangements of the individual factors change, and some of these fall into a fairly definite pattern.

Countless centuries have passed since man first became conscious of this meteorological procession. Countless more passed before he began to realize that there was an orderly sequence to the line of march. Only a few decades have passed since he began asking the "why" of that particular order, and scarcely a thimbleful of years has rolled by since a few adventurous spirits suggested that man himself begin to try his hand in arranging that procession.

In spite of this increasing awareness of the whys and wherefores of weather changes, meteorological discoveries are not made over night. Most of them are the result of years spent in the painstaking collection of data—of careful evaluation and interpretation of that data, and, finally, the application of knowledge gained to actual cases.

During the war, as circumstances permitted, the

urtain of security was lifted from time to time and he public was given brief glimpses of how these new neteorological applications were being used—on laming battle fronts, on Greenland's remote ice cap, n jungles, on mountain tops, at air bases and landing ields all over the world. To the general reading pub-ic it seemed as though the weatherman had suddenly come awake after years of dreamily doing nothing but issue predictions like "cloudy tonight, rain to-morrow"—a job that sounded pretty simple to the average layman.

Actually, the period of 1936-1940 was one of active development in meteorology in the United States. But it took a while for the news to reach the average reader. Then, too, what the general reading public did not realize was that these new and seemingly miraculous meteorological applications could not have been made without the wealth of data patiently collected by weathermen. Nor could they have been put into effect without the tremendous impetus of global war, fought on the earth and above it, on the sea and under it—in many latitudes and climates. Never before had it been so vital to know, far in advance, what kind of weather the coming days had in store.

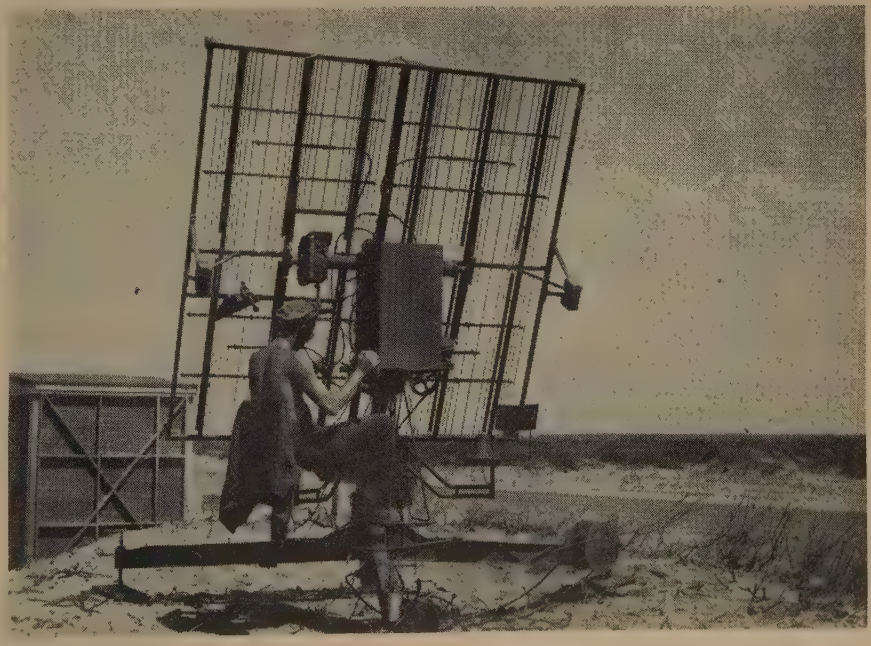
Some of the meteorological developments of the postwar era arrived at their destinations by devious routes. Take radar, for example. The principle on which it is based was first proved in 1886, and the first patent on its use in navigation was granted to a German engineer in 1904. And then the idea rested until wartime needs gave impetus to its development after 1935. Eventually, it was learned that radar could be used in weather forecasting, as well as in navigation, in locating targets and in detecting the approach of enemy raiders.

Radar, derived from the phrase *RA*dio *D*etection *A*nd *R*anging, is based on the principle that radio waves are reflected from solid objects. The rays also are deflected by less solid objects such as clouds and these cloud echoes—or, to be more precise, precipitation echoes—frequently may be observed on radar scopes. Sometimes they blot out other targets.

These cloud echoes are caused by a reflection of the radar pulse from the rain drops in the clouds. They may be distinguished from other echoes by their fuzzy and diffuse appearance. Peculiarly enough, not all clouds show up on the scope with equal strength, for the size of the water drops within them seems to influence the strength of the echo. Ordinary stratus clouds that form an even overcast are not usually visible on radar scopes, while violent showers and storms give intense echoes. Storm echoes, because of their greater vertical spread, can usually be seen much farther than normal land targets.

Radar, of itself, does not give a complete weather picture. While its rays can penetrate far above the clouds and gain information about wind currents the existence of which are only suspected, its range is limited to within one hundred or two hundred miles of the station. Weathermen, who think in terms of world-wide movements of air masses, have to cover

At the right is one of the big rawinsonde balloons to which are attached delicate instruments that transmit weather information aloft to such instruments as the radio detection unit below.



Inspecting a radar antenna on a plane that is to be used in a series of investigations into the hazardous phenomena encountered by pilots in thunderstorms.

much greater distances than that.

An advancing cold front, for example, is of vital interest to weathermen when it is still hundreds of miles away from their particular areas. Nor is the cold wave itself the only weather factor to be considered. Conditions in New England, in Canada, in the Middle West, or in the Caribbean, may determine whether citrus growers in Florida can sleep peacefully or must prepare to spend a frosty winter night firing their orange, grapefruit and tangerine groves. Conditions far away or high aloft can send a cold front rolling down toward Florida, or can shunt it off in the direction of Maryland—and the forecaster in the frost warning area must see the whole picture before he can predict accurately.

Until a few years ago, air currents aloft were detected by sight alone. The observer watched the flight of a free balloon, measuring its course by means of a theodolite. Naturally, when the balloon disappeared among the clouds, or when rain blotted out all traces of its flight, the observer could make few observations.

Then along came the radiosonde, a small radio sending set carried aloft by a balloon. As it rose, higher and higher, the transmitter sent out signals reporting on temperature, pressure and humidity. These were caught and translated by a receiving set on the ground. But still there was only a visual check-up on air currents.

A wartime marriage of radiosonde with radar direction finding equipment resulted in a new offspring —rawinsonde (ra-win-sonde). This is radiosonde, plus a radio receiver indicator with azimuth and elevation radar-type oscilloscope and antenna. As the balloon-borne equipment rises, a direction-finding unit on the ground can compute wind direction at various levels, along with temperature, pressure and humidity.

It takes two observers to keep track of the rawinsonde and the information it showers down upon them. One observer operates the direction-finding unit, acts as winds-aloft computer, and is in general charge of the equipment. The other observer operates the radiosonde ground equipment and calculates altitudes, which sometimes reach as high as a hundred thousand feet above the earth, on the basis of once-a-minute azimuth and elevation angles recorded by his partner and transmitted from high in the skies.

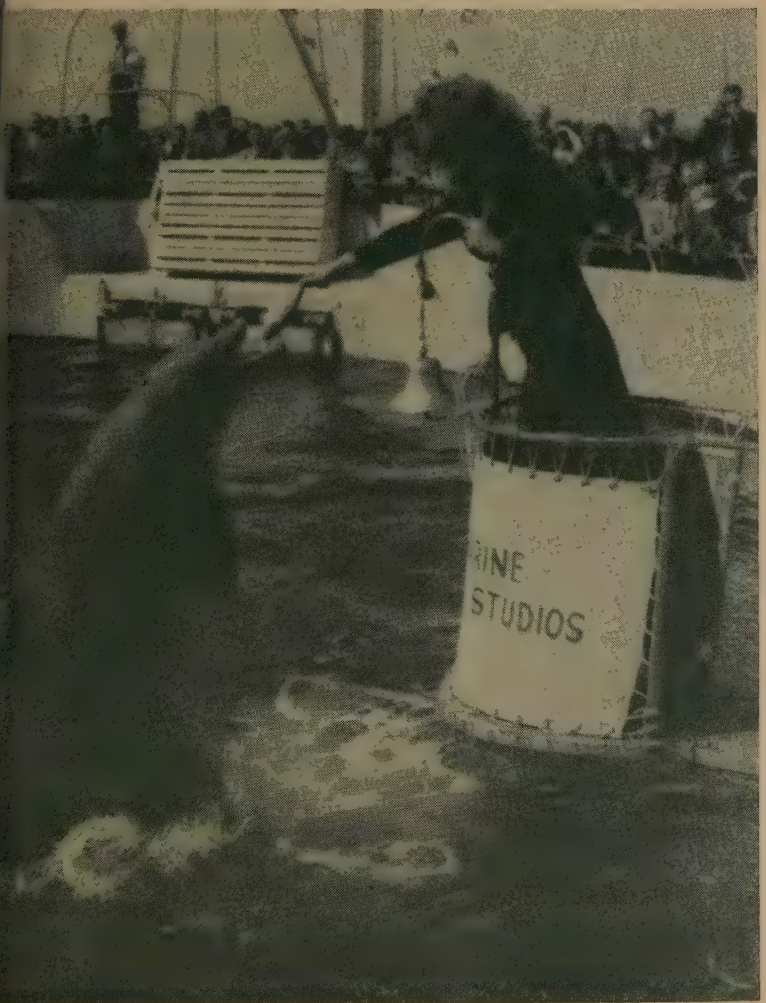
When they are through they have a picture of conditions aloft, and especially of the wind currents on which the advancing weather rides. It may be that a cold wave is rolling down from the northwest, or it may be that a hurricane is roaring up from the Caribbean. But, when the worldwide pattern is fitted together (worldwide, for weather recognizes no national boundaries), the weathermen have a much better idea of what will happen when those weather conditions reach any given point.

Today, some twenty stations of the United States Weather Bureau take twice-daily rawinsonde observations, one at 10 a.m. and another at 10 p.m. Three of these stations are located in Alaska, one is at San Juan, Puerto Rico, and the others are in the United States proper. At present there are also some seventy-six radiosonde stations in the United States, Alaska and the Caribbean island possessions but, according to Weather Bureau plans, these will be converted to rawinsonde stations as rapidly as possible. Thus, the meteorological picture will become more complete than ever before.

Radar itself, while not so useful in long-range weather detection, is of great importance in checking on localized disturbances such as thunderstorms. These are of immediate interest to people caught out in them, and of great importance to airplane pilots who find the big cumulonimbus thunderheads, with their attendant areas of turbulence, looming up along their flight paths.

Anyone who has flown through or near one of these big, cozy-looking, anvil-topped, overstuffed-sofa-cushion thunderheads knows just how bumpy the ride can be and how much the plane can be tossed about. To spot these storm centers (Continued on page 498)

ne Marine Studios at Marineland, Florida, present a unique oceanarium that rovides visitors with windows to the sea. Below, the leaping porpoise leans rward to reach the free lunch offered by the young lady officiating as assistant feeder for the afternoon porpoise performance.



Windows into the Sea

By HUGO H. SCHRODER

Photographs by the Author

THE two hundred portholes at the Marine Studios oceanarium, Marineland, Florida, might truly be called "windows into the sea." Through them it is possible to observe a never-ending procession of marine inhabitants, large and small, on parade. Just as in their native element, countless denizens of the deep have been brought together amid natural surroundings and in huge tanks. There ugly looking sharks and beautifully colored angelfish may be observed in the same oceanarium with scores of other species of all sizes and shapes; colors of the inhabitants range from drab grays through all the hues of the rainbow.

Some men have ventured to the floor of the sea with diving equipment in order to observe the actions of the fishes and other marine forms, always with the risk that some large creature might interfere with their life-giving connection with the ship at the surface. A few men have been privileged to view the teeming life of the sea through the window of a bathysphere.

At Marine Studios, certain sea mammals, many species of fishes, and a host of other marine creatures may be observed amid natural surroundings just as they live in the open sea. There many secrets of the deep

A lacy-finned filefish shows off its odd-shaped mouth for the benefit of the photographer. Below, a graceful black angelfish swims near the bottom of the oceanarium against a submarine background. Its mouth has a pugnacious look to it.

have been revealed before the eyes of the Marine Studios scientists, and to the general public. All this takes place without any of the discomforts or dangers encountered by earlier seekers after Nature's marine secrets.

Aquariums have been established in various parts of the world. Usually the specimens exhibited are segregated in small tanks, or are grouped with closely related species—or those that live in harmony with their neighbors—in one compartment. At Marine Studios there are two large oceanariums where the inhabitants of each section are grouped together without regard to whether or not they live harmoniously with their neighbors. Life for the inhabitants is approximately the same as life in the sea might be, with the exception that food is provided regularly so that there is less need for the large inmates to prey on their smaller neighbors. Yet, when hunger demands, there may be a quick lunge and some

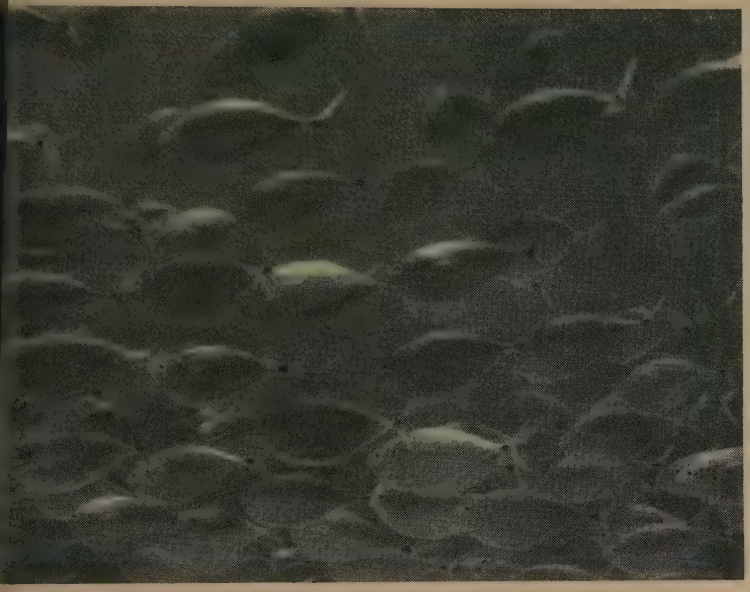
A huge sea turtle swims just under the surface of the oceanarium.

hapless creature disappears.

In order to protect the small, rainbow-hued tropical fish from their enemies, a coral reef has been duplicated on the floor of the larger oceanarium. Even the barnacled remnant of a small sunken ship affords shelter for various species.

Marine Studios is not just another Florida attraction constructed for the sole purpose of luring visitors. While the attendance of the general public is an important factor in maintaining such a huge undertaking, the oceanariums were designed to allow movie

The blue parrotfish accommodatingly shows the parrot-like beak for which it is so obviously named. Below, scores of bumpers, small, silvery fishes that usually travel in large groups, swim before one of the observation portholes.

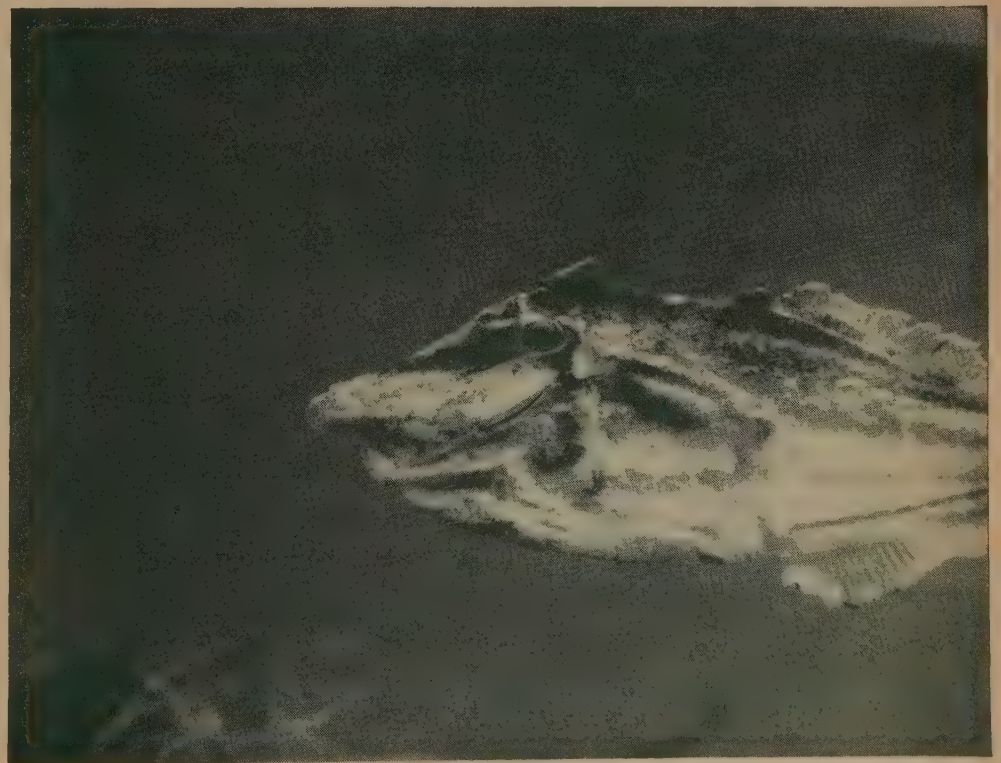


companies to film marine life under natural conditions and from all possible angles — from the surface, through the numerous portholes at varying levels, and even from underneath. There is a series of windows placed at an angle so that it is possible to look up at the inhabitants as they pass in review.

Another important objective was the possibility of discovering more about the habits of the various marine creatures that it was possible to capture and keep under observation. The staff members keep check on the behavior of newly arrived creatures before placing them on exhibit. They maintain their own fishing fleet in order to capture specimens, and to keep them properly until they can be released for observation. Not only staff biologists but visiting scientists have studied the varied life at Marine Studios, a constantly changing panorama.

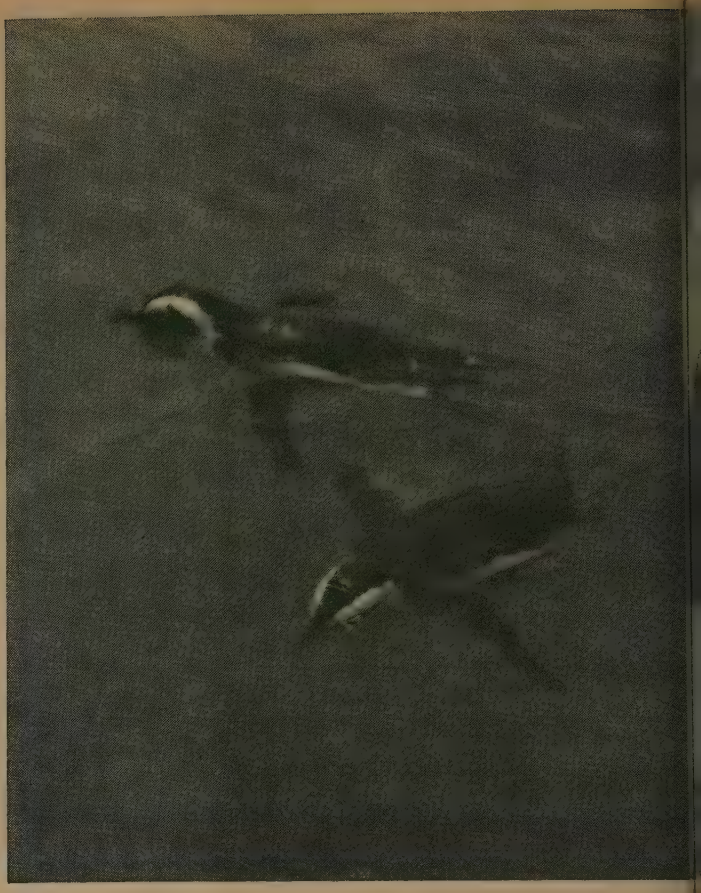
Only recently one of the porpoises gave birth to the first living baby porpoise ever to be produced in captivity, thus giving scientists the opportunity to observe the mother and baby porpoise at close range at all times. During the first year of operation, a mother porpoise and her offspring were captured together. The youngster remained almost constantly near her mother.

Scientific records are kept on the various species in captivity, and thus an enormous amount of valuable information has been obtained about the thousands of specimens har-



This strange-looking creature is one of the fantastic filefishes.

A fifteen-foot sawfish swims just below the surface. Note the remora, or sucking fish, attached to the upper side of the fin at the right.



These swimming penguins at the Marine Studios demonstrate how they use their wings and feet to swim in the water when necessary.

bored there during the years since its establishment.

Constant variation in the marine population is assured by the addition of new specimens regularly. Some of the larger creatures are occasionally lost because of their need for a greater exercising range than it is possible to provide for them, even in a large tank. Smaller creatures may be devoured by their neighbors from time to time.

Some of the large, spectacular marine creatures that have been, or are now on display at Marine Studios are the huge manta ray, giant sawfish, enormous sea turtles, numbers of large porpoises, sharks of various species, strange-looking manatees or sea cows, as they are more familiarly known—lumbering jewfish, and rays of various kinds.

Among the smaller species are many kinds of food fishes with which the Florida salt water fisherman is familiar, along with a wide variety of colorful tropical species and numerous curiosities of the sea. Strange looking cow-fish, box-fish, globe-fish, file-fish, trigger-fish, porcupine-fish and trunk-fish disport themselves in the large tank with rainbow hued parrot-fish, butterfly-fish, angel-fish, squirrel-fish, pork-fish, hog-fish, blue tang, and a host of other colorful finny residents.

Numbers of remoras, or sucking fish, fasten themselves to sharks, turtles, or other large creatures, illustrating how they "hitch hike" in the sea. On one visit to Marine Studios, I secured photos showing a number of remoras fastened to the upper side of a giant sawfish. Anywhere from one to five remoras were being given free rides by their unwilling host.

Perhaps the outstanding attraction at Marine Studios, is the thrice-daily feeding. At 11:00 A.M., 2:00 and 4:00 P.M. an attendant brings a supply of fish to the upper deck to feed the porpoises. A ship's bell suspended in the water sounds the mess call for these agile mammals, which leap out of the water to take fish held out to them. When a fish is thrown into the water at the opposite side of the tank, porpoises race for the morsel. During the feeding, a hungry cormorant or pelican may sidle up to the attendant for a fish snack. Following the surface feeding, a diver descends into the tank to scatter food for the other inhabitants, or to have huge porpoises follow him to take food from his hand.

Throngs of visitors crowd to the upper deck to watch the performing porpoises exhibit their acrobatic skill. And everyone crowds downstairs when the diver begins his underwater feeding.

Cameras are everywhere in evidence, recording the leaping of the porpoises at the surface, the barrel roll of these playful mammals under water, or the activities of the other inhabitants. While many of the creatures are constantly on the move, some species pause at the windows, allowing close-up portraits.

Certain species of fishes seem to be as much interested in the strange faces on the other side of the porthole, as the human visitors are to observe the colorful or fantastic fishes inside the tank. Groupers, porcupine-fish, parrot-fish, and other species frequently remain in position behind the glass for a look at the visitors.

About 5,000,000 gallons of sea water are pumped through the tanks daily, thus giving the inhabitants conditions similar to that of the open sea.

Marine Studios is the world's biggest fish bowl, where the lives of the inhabitants may be observed from the top, the sides, and underneath; where scientists may glean knowledge about the every-day lives of salt water fishes, marine mammals and many other forms of marine life, where camera fans may train their lenses on a greater variety of marine subjects than may be found anywhere else at close range; where one may spend a pleasant day just watching.

Albert, the kinkajou, casts aside a carnation and an all-day sucker in favor of a bunch of grapes, which, with bananas, are his favorite foods, at least among the fruits. Below, Albert is all ready for a cooling dunking, for that tired feeling. The wash basin just fits as a tub.

Albert Leads the Life of Riley

Photographs by Lilo Hess

ALBERT is the name of the pet kinkajou shown here, and, as may be seen, he truly leads the "life of Riley" with all the comforts of home, as humans know them at least. The kinkajou, known to science as *Potos flavus*, is a native of Central and South America. Its yellowish-brown fur is rather short and soft, indeed, almost woolly. It has a short and rounded head, and a long and prehensile tail. It is one of a few mammals, partially carnivorous, having a prehensile tail.

Kinkajous are tree-going animals living in holes in trees and feeding largely at night. They eat what small birds and mammals they can catch, and vary this diet with fruits. They also enjoy honey. In captivity they seem to prosper on a diet that is largely made up of fruits and some vegetables. The animals are equipped with efficient claws for climbing, and their long tongues can lick insects out of crevices in trees and bark.

As a pet a kinkajou is usually good-natured and playful, enjoying attention. Its nocturnal habits, however, make it better adapted for life as a zoo inmate than as a private pet at home.

Albert drops in to see if the boss is awake, and, to take a good look, climbs to the top of the door. He is an excellent climber. There was nothing like this where the kinkajou came from, so he sniffs the ice cream in an exploratory way before he tries this delicacy.

The Mourning Dove

By EDWARD A. PREBLE

Photographs by Bernard and Emilie Baker

MOURNING doves breed in every state in our Union, and in the days of the muzzle-loading gun were generally spared. Most sportsmen then refused to consider any of the pigeons as game. The bobwhite was still abundant, but with the growing use of the breechloader in the 1880's, the bobwhites in the South began to decline, and the mourning dove gradually became "game" in the eyes of gunners seeking targets.

Up to the 90's the dove was enormously abundant; a pair might raise four or five broods a year. As the passenger pigeon had been considered inexhaustible, so did many regard the dove.

Then came the Migratory Bird Treaty with Canada, and bird-lovers demanded more protection for the dove. This was resented in the South, where many hunters insisted that the dove, present all the year,

At the top of the page, left, a mourning dove nest with three eggs. Usually there are only two, and a third egg may be laid by another female. Right, above, two young birds hatched on successive days. The incubation period is fourteen days, and the eggs are laid on successive days. Therefore, incubation begins with the first egg laid. Left, a fledgling, now eleven days old and ready to leave the nest.

A mourning dove brooding young that are only a few days old. Adult birds weigh from four to six ounces, and justification for killing them for food is therefore very scant. Although they are on the protected list in Michigan, Ohio and other northern states, they are considered as game birds over much of their range, especially their winter range, and are killed in large numbers by the gunners.

was not a migrant. However, the law-enforcement officers won their case. Then the hunters were forbidden to kill more than twenty-five doves in any one day. But the gunners were many, so fields were baited with grain, and ponds where the birds must go to drink were utilized for the benefit of many hunters. This cowardly baiting of birds, even such innocent and useful ones, was considered so generally a vested right that several years of deliberation passed before the federal authorities outlawed the practice. In those days there was an advisory board on migratory birds, the majority of whom were gunners or their representatives. But on one occasion an old hunter from southern Alabama—all honor to him—protested the shooting of mourning doves in September, when, he contended, and proved, many doves were still nesting. If the parents were shot, their helpless young must starve. We note that in 1930 the two southernmost counties in Alabama, the home of the doves' friend, "to take care of peculiar local existing conditions" doves were not to be shot until November, and we vividly remember the nest of a mourning dove sent in from the South with two dried-up baby birds that had starved because their parents were killed, and which was exhibited in Washington. And such tragedies still occur.

Many people in our southeastern states are fearful lest they lose their dove, for studies indicate that its numbers are steadily growing less.

We are genuinely concerned, in reading Circular 10 of the Fish and Wildlife Service, "The Mourning Dove as a Game Bird," to note the following statement in the foreword: "The Fish and Wildlife Service has long urged delay in the opening of the hunting season on the mourning dove until October 1 or even later in the southern states east of the Mississippi River. Because the hunters, lacking knowledge of the real need for delayed shooting, failed to support this stand, late September hunting has been permitted. Administrative agencies unfortunately cannot conduct management strictly on the basis of the creatures involved . . ."

In other words, the agency charged by law to administer the provisions of the Migratory Bird Treaty Act seems willing to ignore its trust in favor of the hunters, who are willing to destroy the natural resources that the Treaty was invoked to protect! Where then, shall the helpless birds plead their cause?

Public Land Threat Takes New Turn

From William H. Carr, Chairman of the Arizona Wildlife Federation, comes an urgent appeal to Eastern conservationists to join actively and militantly in the battle to save National Forest, National Park and other public lands for the people to whom they belong. This appeal arises from the character and intent of hearings being held throughout the West by a sub-committee of the House Committee on Public Lands. The threat to these lands today, Mr. Carr warns, constitutes a critical conservation crisis.

"Is it thoroughly understood," the Arizonian asks, "that this new threat is actually more insidious than the one to transfer public lands, including National Forests, to private possession? Having failed in their initial attempts at private acquirement of Federal lands, the stockmen are now trying to gain even greater personal use of the ranges, from the mountain tops to the deserts, through hamstringing the Forest Service, the already grievously weakened Grazing Service, and all other land managing agencies, by means of a concerted drive for budget reduction.

"It is a *new* strategy at this time and is powerfully organized. It must be combatted accordingly. It is an effort, on a grand scale, to intimidate personnel responsible for the conservation of watershed areas that serve millions of our citizens; enormous grazing regions; forests that are *national*, and other similar public properties of untold value to water users, sportsmen, recreationists, and all who use our resources in any manner, or desire their protection for generations to come. It is an attempt to nullify scientific conservation practices and policies gained through the past half century."

The hearings that are being held are presided over by Congressman Frank A. Barrett of Wyoming, a man interested in the cattle business, or by Congressman Robert F. Rockwell of Colorado, who has cattle grazing on National Forest land. The impartiality of such presiding officers would be too much to expect, and the manner in which the hearings are conducted leaves no doubt that such impartiality is non-existent. Mr. Barrett, who is noted for his bullying tactics, has been so openly partial and prejudiced that Mr. Carr declares that he should be disqualified, that "his behavior is a disgrace to our form of government. He has demonstrated that he is an outstanding enemy of the land." Having attended hearings over which this Congressman has presided at the National Capitol, we would be inclined to feel that even these strong words are an understatement.

The western hearings have degenerated into a "trial" of the Forest Service; an attack upon the integrity of its chief, Lyle Watts, and its personnel —an attack instigated and abetted by the Congressional committee. Long and sympathetic attention is given to the plaints and tears of the stockmen, while only a few minutes are given to men who can provide the scientific facts of watershed impairment by overgrazing, or otherwise present the case for our public land management policies.

"The dangerous and dishonest work of the committee *must* be nullified by widespread publicity," Mr. Carr asserts. "The easterner has a very large stake in these proceedings, yet no one from a single eastern conservation society is attending the hearings. This fact seems incredible. This is a tremendous fight and must be joined. Are the multiple values of our land resources actually apparent to the eastern people? It is known, for one thing, that eastern industry is closely related to the productivity of western national resources."

It is probable that Mr. Carr does not realize that eastern conservationists have presented the case in Washington, and will be heard there whenever the opportunity offers. There they have encountered Mr. Barrett, and have ample occasion to observe how he rides roughshod over other members of the committee, or is abusive to American citizens exercising their right of free expression before a Congressional committee established for the purpose of hearing that testimony. Appearance of eastern conservationists at hearings held in the West would, it seems to us, be at the expense of time properly given to western testimony.

We may take encouragement from the fact that the methods of the committee have created local indignation in its wake. After the hearing in Grand Junction, Colo., *The Daily Sentinel* characterized the hearing as "not in the American tradition" and said that it was "presided over by a chairman, also a party to the controversy, and who, in effect, became a prosecutor, missing no opportunity to denounce the other party in the dispute, who was given limited opportunity to present its case."

More than a year ago *Nature Magazine* sounded one of the first warnings about the projected drive of special interests against our public lands. We are happy now to warn of this new tactic, and to point out the un-American, Fascist tools being used to implement this strategy. Mr. Carr may be sure that eastern conservationists are fully alive to the issue and will be as vocal as they are permitted to be before the committees of the Congress.

Flat as A Halibut

By EDWARD W. ALLEN

THE floundering flounder and the hale halibut, not to mention the serene sole or the placid plaice, all belong to the same big family. All are flatfish.

How many persons who gaze into an aquarium tank curiously watching a flounder half buried and almost indistinguishable from the bottom sand, or looking like an undulating pancake as he quickly moves across the scene, stop to wonder why he is so different from a tuna or a trout? And how many of these gazers know that this funny fish is really swimming on his side?

Members of this family of fishes, when they pop the egg, snuggle what is left of it under their chins and swim away like ordinary fry, back up, belly down. But soon after this strange things start to happen. One eye begins moving its position upward on the fish's face, over the ridge and downward—the other eye moving downward at the same time—until, in time, both bulging eyes are on one side of the head. In the case of the North Pacific Coast halibut both eyes wind up on the right side of the fish, although an occasional freak is left-sided. Other members of the flounder tribe have a left-sided preference, while some appear to be indifferent.

At the same time that our little halibut is shifting eyes, he is also dressing up this seeing side with iridescent colors. The drabness of the gray that one sees on the market counter follows when the spark of life is gone. The blind side, in the meantime, is taking on a creamy white. A third phase of this remarkable phenomenon is that, during the period that the eyes have been shifting and the color changing, this diminutive fish has also been angling over in the water so that at the conclusion of the process, in some five months or so, he is swimming flat, his two-eyed pigmented right side turned up, his creamy eyeless side turned toward the ocean bottom. And this is the way he spends his days and nights the rest of his life.

Flatfish have their ups and downs in other ways than swimming. Paradoxical though it may seem, these fishes' peaceful time is while the human race is at suicidal war. Man is one of the most vigorous enemies of flatfishes, so that whatever diverts men from fishing gives the fish corresponding relief.

During the recent wars, the North Sea plaice enjoyed their peaceful eras and had a chance to recover to some extent from the preceding periods of overfishing. The waters were too dangerous for the British, Dutch or Germans to do their accustomed fishing. Besides, many boats were needed for war purposes or were sunk. With war over, people cry for food and the onslaught on ocean fish commences with renewed vigor.

PHOTOGRAPH BY RAY KRANTZ

A truly big halibut from the Pacific Coast banks. With the halibut the females rule the roost and a big one like this is always "she."

In the North Pacific, halibut fishing started before the beginning of the century in the waters near Seattle and Vancouver; gradually increased in volume and expanded until it extended from northern California over all the coastal banks clear around to Bering Sea.

With the First World War and its aftermath, halibut became such a popular food that the fishing fleet multiplied. No one thought that the supply might be exhaustible until the catch per boat started down, down, down, even though the skipper may have gone a thousand miles or more away from port seeking new banks. At last it became hardly profitable to fish at all. Because this was, and is, a joint Canadian United States fishery, neither nation acting alone could

he *Scandia* was chartered y the International Fisher- s Commission for use on s investigations, and the cientists encountered icing onditions like this, al- nough they did not enjoy nem any more than did the fishermen.

ubject it to adequate con- ervation regulation.

Then the North Pacific alibut industry started some- hing new in the history of nternational relations, and n the field of conservation. o be sure it started with just familiar cry of distress to Ottawa and Washington, but the response was some- hing new.

Canada and the United States, in 1924, ratified a reaty creating the International Fisheries Commis- ion, two members from each country, to conduct an nvestigation to see what could be done. Investigating committees are nothing new, but this one was dif- erent. Its members were not interested in politics, for they got no pay. They did pledge themselves to seek the facts through the most effective scientific methods they could devise. They employed the best qualified biologist they could find, gave him free scope to gather together the ablest scientific assistants he could get and backed him up to disregard unproved theories and guesses, go out on the grounds, dig into the records, and learn whatever of value could be learned from any source.

Although ichthyologists already had notions con- cerning eye-shifting and some of the other propensi- ties of flatfish, strange to say almost nothing very definite seemed to be known about the life history of the big bully of the family, the halibut. This was so in spite of the fact that halibut had been fished in the North Sea and off the coast of Norway for cen- turies. So the Commission started practically from scratch.

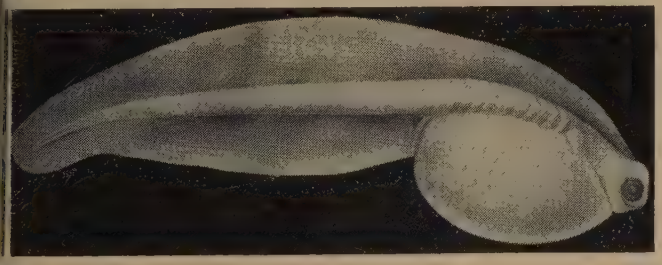
The Commission neither bought nor built any high-toned cruiser. When needed, an ordinary halibut schooner was chartered, some scientific apparatus in- stalled in addition to her ordinary fishing gear, and, with her regular crew aboard, the then Scientific Di- rector, Dr. W. F. Thompson (H. A. Dunlop, Dr. Thompson's assistant at the time, is now Director), with members of his little staff, bobbed around the turbulent waters of the North Pacific just as uncom- fortably as any fisherman. But they got results.

Never before had an ocean fishery been studied with the practical thoroughness that this North Pacific halibut received. The remarkable story of the migratory eyes, the gradual pigmentation of one side of the fish, his being spawned out near the edge of the continental shelf, his drifting slowly toward shore, his turning over on his eyeless side, his habitat, his sex life, maturity, mortality, in fact his intimate do- mestic habits and economy were thoroughly laid bare.

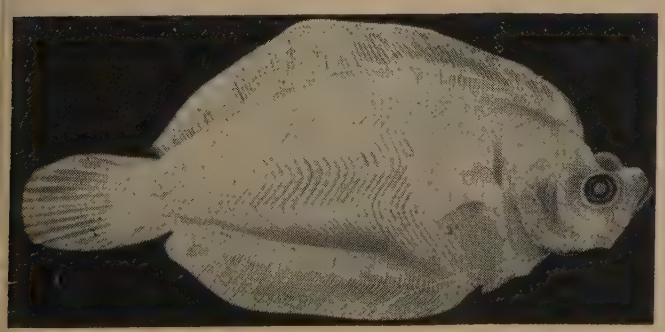
Among other things it was found that there were separate stocks of halibut in certain areas. These did not intermingle to any substantial extent and, hence, required separate treatment.

It was concluded that, with proper regulation, this sadly depleted fishery was capable of being restored. It was recommended that an international joint com- mission be created with regulatory powers.

So a new treaty was entered into between Canada and the United States. It continued the old commis- sion, but added to its powers and duties that of pre- paring regulations from year to year. When these were approved by the Governor General of Canada and the President of the United States they should have the force of law in both nations as to their



The halibut fry snuggling what is left of its eggs beneath its chin, and, below, one eye coming over the ridge and moving around the fish's face



citizens and vessels, both inside their national boundaries and out on the high seas.

This was the first time in history that two independent nations had vested in a joint international body powers of this character. The Commission does not consist of a Canadian section and a United States section sparring with each other for national advantage. It consists of one unified group, of which two members come from one country, two from the other, but who meet as one body devoted to the single task of carrying out the letter and spirit of the treaty for the *mutual* benefit of the two member nations. And the plan works.

In the fifteen years since the second treaty became effective every action of the Commission has been unanimous, and no regulation proposed by the Commission has been rejected. Not only the governments but also the dealers, the boat operators and the fishermen, have backed the Commission. One reason for this support is that from the outset the Commission has called representatives of the fishermen and boat operators into consultation. The carefully collected and analyzed statistical and biological facts are laid before those commercially interested, and any proposed changes in the regulations that the Commission has in contemplation are discussed. Everything is threshed over frankly and openly and in language that anyone can understand.

Use of nets is prohibited by the Commission. Only hook and line fishing is permitted. This includes trolling, but more particularly long-lining. This old but efficient method of catching halibut does not destroy the small, immature fish as does net fishing such as trawling. Long-lining as used on the Pacific Coast has another advantage to the Commission. It affords a unit of measurement of the stock of fish on the banks. This has been of great value in planning the management of the fishery.

The unit of gear used in long-lining is a "skate." This consists of a heavy line 1800 feet long laid out on the ocean bottom, having a short line attached each 13 feet, armed with a baited hook. Anchors hold this ground line in place. Lines up to buoys floating on the surface enable the ground line, with its catch, to be hauled up. Although all practical methods of checking the changes in the condition of the fishery are used, such as age averages, size measurements and netting for spawn, the basic method of determining whether the stock of fish on the banks is increasing or decreasing from year to year, also the rate of change, is by maintaining a most accurate account of the poundage of fish caught for each unit (skate) of gear fished.

Possessed of this knowledge, the Commission each year determines and announces in advance the approximate poundage of fish that it believes can be caught in each of the principal areas into which it has divided the 2000 miles of coastal banks. This is figured so as to leave enough fish not only to replenish the supply but gradually to increase the stock and thus permit larger poundage in future years.

Most unusual is the method by which this catch is regulated. It is provided that fishing shall cease in each area on such date as the Commission announces that it deems that the allowed poundage will have been caught. Such announcement is made from twelve to twenty-five days in advance of the closing date, and the Commission's statistics are so accurate and up to date, and its scientists so expert, that the error is seldom more than five percent. And this is true although the authorized catch for Area 2, for instance (the banks off British Columbia and Southeastern Alaska), in 1946 was 24,500,000 pounds and there are hundreds of both United States and Canadian fish boats out after this catch.

What are the results of this system of international joint fishery management? Without ever cutting the annual catch below what it was when the Commission took hold, the stock on the banks has nevertheless been restored from almost commercial exhaustion to a point that no better-stocked halibut banks are to be found anywhere in the world. The fishermen are catching annually roughly about a third more fish with a third less effort. Out of a total world catch of some 85,000,000 pounds, 60,000,000 pounds now come from these restored Pacific Coast banks. The North Pacific halibut fleet is prosperous as it has never been before. And the public is getting a gradually but steadily increasing supply of this popular and wholesome food.

What is the secret of this success? There is no secret. The Commission has avoided politics; it has based its actions from the first upon facts, unrelenting facts, scientifically ascertained through the best known methods with the (Continued on page 500)

Little Lanes That Wander

By MAREL BROWN

Little lanes that wander through a wood,
Little paths that skirt a meadow's edge,
Wagon roads all gullied-out, or good,
Ancient trails half-hidden now by sedge—
Such simple ways invite our weary feet
To leave the jarring impact and the thud
Of daily march upon the city street—
To know the needled paths, or sand, or mud.
For byways stir the pulse, incite the will,
And fan the embered life to quickened flame;
While ferns, uncurling half-way up a hill,
Seem calling city-dwellers each by name.
O little lanes of healing, never cease
To lure us down your ways in search of peace.

Baltimores and Serendipity

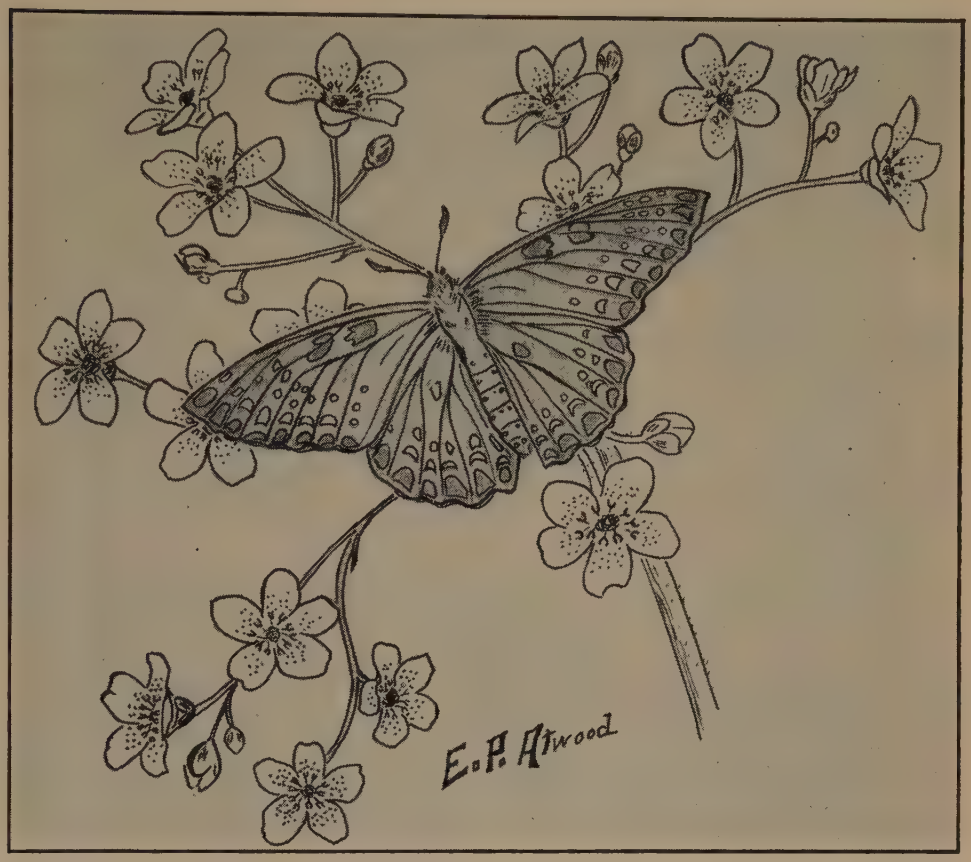
By EDNA PECK ATWOOD

Illustrated by the Author

My astonishment was equally great one sparkling night of winter moonlight when the cat strutted in with the first star-nosed mole I had ever seen. This time it was midjune and broad daylight. Radiant, teen-age Lilibet Longwell skipped up the walk with the surprise gently penned between cupped palms. "What is it?" she asked and showed me an exquisite crescent-spot butterfly, alien to our gardens.

"It's a Baltimore. Where did you get it?" Question jostled information.

"On top of Wheeler Hill," supplied Lilibet. "On a hill! Near water?" I prodded. "Yes, near a small pond," she replied. That explained it; for Baltimores, in their caterpillar stage, live on turtlehead plants, which thrive in wet places. The butterflies are quiet folk, wont to remain near home. Since few people loiter where footing is semi-fluid, a lifetime may pass with no glimpse of such localized creatures. The range of the species includes Ontario and the northern half of the United States east of the Rockies.



Full-grown Baltimore crescent-spot butterfly about one and one-half natural size.

The life stages parallel those of any butterfly—egg, caterpillar, chrysalis, and winged adult—but Baltimore caterpillars vary their part of the serial amazingly. They eat normally until the third molt and then become super-ascetics able to put a Hindu yogi to shame; for they fast from midsummer until the next year's growing season. Prolonged self-denial as "cats" accounts for small size as butterflies. A male's wingspread is one and three-fourths to two inches, and a female's is two to two and six-tenths inches.

Renounced size is compensated with striking color, the same in both sexes. Like the Baltimore oriole, they wear the Calvert orange and black, with added creamy-white crescents and dots. Black has the mastery above, and orange and white beneath the wings—gorgeous cloaks with still more gorgeous linings.

Lilibet's butterfly was left with me while she was in school. It accepted a bribe of flower nectar to pose for a portrait. Never did a professional model pose better or for so modest a fee. Never had I seen such a docile butterfly.

Coveting further knowledge, we went to the spot where the butterfly had been caught. Somewhere in the vicinity would be turtlehead plants with eggs upon them. Search was made of all accessible margins of the little pond. No turtlehead held its head high enough above ranker growths to advertise its presence. Nor did the hazards of briars on approach, and wet feet on arrival, reward with even one butterfly.

Time passed and August came. We explored the wild and narrow gully where sings Cotton's Creek. Too late for Baltimore butterflies or their eggs, we still might look for fasting cats in webbed retirement. On one turtlehead was a solitary, inch-long larva garbed in chic black and white. I put him in a jar and picked turtlehead for his future meals. I might get his pedigree later. Other incidental riches waited all around.

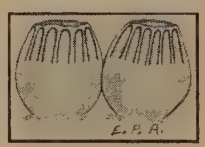
About two hundred years ago, Sir Horace Walpole

coined a word-mouthful that exactly fits the case. Reading a tale of Ceylon about three Princes of Serendip who were prone to set out for one thing and bring back another, he called this gift of finding a valuable or agreeable substitution serendipity. My serendipity hardly rates with that of Columbus, who found America instead of India, but it dispelled gloom.

Large nursery-webs, spun for their young by certain water spiders, mantled many weed tops along the brook. The big mother spider stood guard. The wise say that she watches over but does not feed her young. As many as three hundred spiderlings may hatch from the egg-sac within the web. At first they eat one another. If they were not cannibals, I shudder to think what a place that gully might become!

Turning from the nursery-webs, we were soon marveling over the dimensions of a brownish-black, armor-plated millipede crossing the road. It was all of middle finger length and had so many legs—four to each segment—that it looked fringed. Millipedes are considered harmless. We let this one go its way.

The August sun beat down in the gully. It was hot—perfect butterfly weather. And there they were, too—several viceroys, two banded purples, and a few hop merchants. They were regaling themselves on blossoms of elderberry and white snakeroot, growing there in profusion. Also in that wild spot it was a delight to see a lone hummingbird, probing the jewel-weed flowers. But we startled the hummingbird and he darted away. The insects kept on with their business.



Under side of a turtle-head leaf with rich yellow eggs of Baltimore crescent spot, eggs, greatly enlarged, below. At right, a full-grown Baltimore caterpillar, natural size.

Meanwhile something else was going on. The viceroys and a banded purple were waging a battle for territory. We read of such fights among butterflies, and here was one in progress. A banded purple would venture down the stream a bit and a viceroy would attack. Since both species are so-called 4-footed butterflies, eight sturdy feet tangled in a vigorous kicking contest. They fought, rising to tree-top level. Soon the purple would go back to his former and undisputed domain to sun himself and rest a while. Then he would rise and drift back to the arena and the fight would be resumed with the same result.

We left the scene of the battle of the butterflies without knowing the final outcome. Our only tangible loot was the smooth black and white larva. No picture in the insect books represented him. Nor did I identify him that year. During the night he pushed his way through 2-ply netting and escaped. I did not find him readily. A young friend crept about hunting and found him—crushed on his arm. That was that. I had planned to preserve him in a sketch. Instead I preserved beets.

Then the luck, or lack of it, broke. A cousin listened to my tale of frustration. She believed that she had recently seen turtlehead with webs on it. We lost no time in faring forth with spade and ash bucket, just in case. Eight miles from home, in tow of our observant relative, we wriggled through a barbed wire fence, crossed a wide pasture, skirted pools where the drying creek persisted, snagged our old hose on still another barbed barrier, and dug up the pot of gold at the foot of the rainbow. Such a haul! There were two nests of Baltimores. Peeping down the web tunnels we could see a few of the furry inmates. Turtlehead roots intermingled with those of goldenrod, wild aster, grass, and strawberry. It did not matter. All were scooped into the ash bucket with care and high glee. Homeward bound through deepening dusk, we glimpsed a doe crossing the peaceful valley en route to some water-hole. Another thrill!

The copiously watered turtlehead prospered. Sometimes two or three of the Baltimore cats would come outside the opaque web and add a bit of silk. Such economy of motion! Such torpor! Or was it somnambulism? Like the farmer's hired man, they needed to be sighted over a fence post to make sure they moved at all. And they ate nothing. What a solution they offer for a food and fuel shortage! A lesser order derides man. Instead of succeeding for untold centuries, how strange it is that their fast did not end fatally at its first trial! After dreamy spinning and perhaps a siesta, the cats would withdraw into the seclusion of the nest. So it went all the fall.

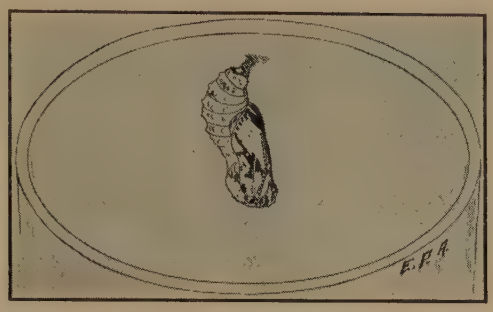
Late in September, the nests were put into a glass jar, covered with 4-ply netting. Presently I discovered that my cats had company. A very small, colorless insect shared the larger nest. He had active, jointed antennae and seemed in a great flurry. He rushed out, apparently to examine some blasted turtlehead buds, and then rushed back out of sight. He behaved like an excitable little dog, utterly out of place with the sluggish tentmen. I hoped he was not an enemy. At the very least you might expect him to nip their heels to speed them up.

After a few days I saw him again, going over a stub of turtlehead, and studied him further. He was

psocid, related to our familiar book lice. Some psocid species live on decaying vegetation. This was one of those. Presumably he had no designs on the Baltimores.

Next, two lively, fresh-green bugs appeared out of the smaller nest. I put them in a separate jar for observation. Offered turtlehead leaves and seed pods, they fed on the greenest pod. Wingless, they were nymphs of some kind. After a few days they molted and were winged adults, still green. But in a short time their color changed and I recognized them as the tarnished leaf bugs that blast and deform so many flowers. All gardeners detest them.

Winter came, and went early. On March 18, forty-three Baltimores ambled around the jar. During all the many unseasonably warm days that followed, they came from the nests. A drink might be welcome. I sprinkled them in semblance of light rain. By April 12, I put them on turtlehead shoots out of doors. They ate hungrily. But I was dismayed to find a few of them parasitized. Seven, three-sixteenth inch, white cases beside as many feeble Baltimores looked like cocoons of braconids, a family of very small parasites that commonly pupate outside their victims. After a few days in a capped jar, the cocoons produced wasp-like black insects. This species had tan-colored legs. Braconids can be distinguished from tiny species of ichneumons by wing veining. These *were* braconids.



Baltimore chrysalis framed in the chimney top, and, below, two Baltimore nests with goldenrod woven into the larger one.

The parasitized cats live a week or two, scarcely moving. The others kept escaping from the netted area about the turtlehead until failure to raise any butterflies loomed. In desperation I potted a small host plant, transferred three cats to it—all the healthy ones left—eased an antique lamp chimney over all and tied cheesecloth over the chimney top.

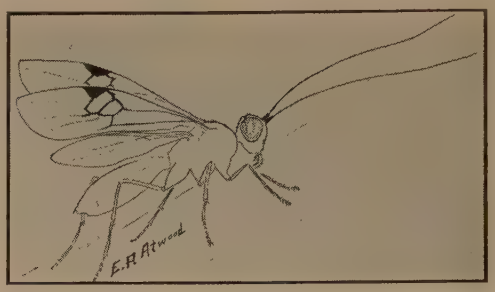
On May 20, I chanced on one of the runaways. One naturalist says that Baltimores live exclusively on turtlehead, except in spring when they come from hibernation. It must be true. This escapee was no emaciated starveling. It had grown noticeably, was energetic, and going places. I popped it under the chimney with the remnant of my pride.

The cats rested between meals on the cheesecloth chimney cover, and soon made considerable silk leading to it. When they ate their cupboard bare, I replenished it, disturbing their webs in the process. So I suspended the bewebbed cloth by its corners beside the fresh food supply. It made a real nest and they used it. All four molted inside it, then two of them got their dates mixed and went into an unscheduled fast, tantamount to sleeping-sickness. The other two ate again after the molt, as they should. Baltimore cats, by the way, do not eat their shed skins; nor do their masks pop off separately, but remain attached to the molted skins, Most orthodox cats are bald headed. These had erect hairs on their brows—ludicrous inverted whiskers. I did not yet know about pre-third molt stages, but these never changed color at any time. Their heads, first two and last segments, were black. The remaining ten segments were orange, encircled by spaced black lines. But such a forest of branched black spines (setae) grew from them that the color effect was rich brown. They grew to lengths one and one-eighth and one and three-eighths inches. On May 22, one hung itself by its tail to a silk button made near the chimney top. The other, on June 3, twelve days later, hung itself to a leaf.

After hanging about a day, there came the final—the fifth—shedding of the skin. It left them chrysalids. This molt, made without concealment, was difficult. They began to weave slowly and gently at first. Their skins had to be loosened. Their tree-like spines rocked back and forth. The skin from which they arose was depressed and then heaved with increasing violence. One muscular earthquake followed another. Surely they survived by the sweat of their brows. Could it be that once they ate apples in Eden? Long and hard they labored. At last a special heave split the skin from head to thorax limit. It was pumped slowly tailward, becoming a furry ball around the tail. Then came a breath-taking second when the chrysalis withdrew its tail from the discard and its only support was a pinch-grip of two abdominal segments on the old skin. Quickly the exploring tail found another grip on the silk button, and the anxious watcher could relax. Vigorous writhings and twistings of the chrysalis felled the skin-ball. The soft-looking chrysalis then began to contract and

stiffen. It became a mere five-eighths inch long. Eye and antennae cases were well defined. Wing cases were soft gray and spotted. The body was orange and black. The spine trees were replaced by wee black cones, and the tail was black, studded with jets. Its beauty defied description.

The cats became chrysalids twelve days apart but the lapse to the butterfly stage was nine days, probably due to warmer weather average for the second one. Both butterflies were within the range of size ascribed to females. They were 4-legged butterflies, that is, their two front legs were dwarfed and useless. They ate and drank well and lived for nineteen and thirty-one days respectively, being contemporaries for ten days. A potted turtlehead was provided for any egg-laying. It was a prime disappointment that I found no eggs, infertile or not.



The parasitic braconid that made single cocoons, and, below, saw fly larva about one and one-half natural size. Yes, they had faces on their backs.

But my serendipity was excellent. On July 10, to my astonished pleasure, a perfect giant swallowtail butterfly burst from a chrysalis that I had expected to produce in May. And, on turtlehead in the garden, I found three black and white larvae identical with that crushed the previous season before identification. Each boasted eleven pairs of legs instead of the eight pairs of the usual caterpillar. They were saw-fly larvae, not cats at all. I adopted and fed them and noted another saw-fly larvae characteristic, their frequent habit of curling up, either partially or completely. They molted, grew to larval maturity, and disappeared in earth to winter as pupae.

Also I discovered that new-hatched ones of the same species were colorless, developing their markings slowly, and that their eyes were like those of a fly—completely different from the ocelli of caterpillars. The deformity that results when a saw-fly lays her eggs occurred along the midrib beneath a turtlehead leaf.

On June 20 of the third year of the search, word came of a sparrow-like bird sitting on two eggs not alike. Investigation led to a berry bush near a country road. We found a female indigo bunting warming a cowbird's egg with one of her own. Having removed the offending egg and homeward bound, we stopped to enjoy the raptures of a catbird in the tangle where a spring forever seeped into a cup in the hillside, out through a culvert, and creekward. There I forgot the singer in raptures of my own. Two Baltimore butterflies lazily fanned their wings beside the ditch. We went after boots and excitedly hunted hidden treasure. We found it, too. Turtlehead was plentiful. Under its leaves we found five clusters of tiered eggs, as yellow as grass butter. I took a cluster home with me and estimated its contents as about three hundred and fifty eggs. While hunting, my good fairy was a small (male) Baltimore butterfly, perched on a finger. When I found a large and a small Baltimore cat, I jilted him for them. Bending close to collect them on their host plant, I saw a braconid disentangling her legs from the spines of the smaller cat. Although that spelled doom, the cat died next day by accident. For some time the larger cat seemed healthy; then it grew logy, soon explained by emergence of twenty braconid larvae. They spun a colony-cocoon. Each had its individual case in sardine-pack with its fellows, all wrapped in a cottony mass. In twelve days the cocoons hatched. Under the microscope, slight variations proved these braconids to be a different species than the earlier ones that had made single cocoons. So the Baltimores had braconid enemies of two species.

But I could now forget delays and disappointments, for the precious golden eggs were to complete the story. Two days after discovery they became tan-colored. At further two-day intervals they became reddish-brown and then the color of ripe Delaware grapes. They held that color for eleven days and then were a soft gray, tipped with a dark and shining spot. Next day they hatched. The contents of those wee, crimp-topped barrels poured out on the leaf. Very much alive, they abandoned the shells and began to make silk carpet and to eat. They were a soiled-white and microscopically hairy. Some traveled to the leaf stem and thence to the opposite leaf. It was the engineers out to start a nest.

When one day old they had partially skeletonized a leaf, drawn its edges together, and were spinning across the nearby leaf axils, scattering to considerable extent. They grew fast and became tan-colored and plainly hairy.

(Continued on page 500)

To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then, below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south.

Great Comets Are Few in Number

By ISABEL M. LEWIS

FROM the year 2349 B.C., the date of the first reported observation of a comet in the Chinese Annals, to the end of the year 1940, 1503 comets have been observed. Of this number only 480 have been distinct appearances of different comets. The great majority of the observations have been those made of comets returning periodically to the sun.

If a "great" comet is defined as one brilliant and spectacular in appearance upon its approach to the vicinity of the sun or near the time of perihelion passage—one that the most casual observer of the heavens will immediately recognize without searching by its distinctively cometary appearance—then few of us indeed, in a lifetime, have seen more than one or two of the truly great among the comets.

No comet that remains a telescopic object, even when near the sun and most favorably placed for observation from the earth, however interesting an object it may appear in the telescope, would be referred to as a great comet. Most comets whose appearances have been recorded in history prior to the discovery of the telescope have been great comets because, necessarily, they would have to be bright and conspicuous to be seen at all. At the present time nearly all comets observed are telescopic objects only. Occasionally one will be found, if much brighter than the average, with the aid of a field glass, if one knows where to search for the visitor; or it may even be visible to the naked eye when most favorably placed as a fuzzy patch of light or as a small, distinctively cometary object with diminutive tail, glimpsed with difficulty. There happen to be at this time ten comets under observation, but only one can be seen in a telescope of moderate size. The remaining nine comets are so faint that their positions are recorded only with the aid of the most powerful telescopes. Short-

period comets whose orbits extend, at most, not far beyond the orbit of Neptune are, with few exceptions, telescopic objects. Encke's comet, which has a period of 3.3 years, the shortest known, has been seen at more than 40 of its returns to the sun since the date of its discovery by Mechain at Paris in 1786. It was named for Encke because it was he who showed that this comet was identical with one that appeared in 1819, and with comets that appeared in 1795 and 1805. It is expected that this comet will be picked up at any time now as its return to perihelion is expected to occur some time near the end of this November.

Halley's famous comet, which returns to the sun approximately every 75 years, is one of the great comets, the only one of short period that can be so called. This comet was named for Halley because it was he who discovered that the orbits of certain comets appearing at intervals of about 75 or 76 years were very similar, and he concluded that they were the same comet. He predicted that the comet of 1682, which was one of these comets with similar orbits, would return again in 1758. Although Halley did not live to see his prediction confirmed, this comet did return in 1758, and has, since that time, been known as Halley's Comet. Early appearances of this comet were traced back as far as 467 B.C., and the return of Halley's comet to perihelion in May, 1910, was its thirtieth observed return. The appearance of this comet in 1910 was spectacular and brilliant. It has been the only really great comet that has appeared so far in this century. There was a bright comet, discovered in January, 1910, in South Africa, which was expected to become one of the great comets. This comet was visible close to the sun in bright daylight, and was then brighter than Venus and had a short tail, about a degree long, seen with the unaided eye. It soon became visible only telescopically and one would hesitate to class it among the great comets. A second great comet of the twentieth century is now overdue.

In the nineteenth century many great and remarkable comets were observed. The comets of 1811, 1843, 1858 (Donati's Comet), 1861, Coggia's Comet of 1874, the Great Southern Comet of 1880, Great Comet of 1882, and comet of 1887, the latter visible only in the southern hemisphere, were all great comets. The comet of 1811 was one of the greatest ever seen. It was discovered in March of that year and was visible for 17 months. In the fall of 1811 it shone brilliantly throughout the night for weeks. The length of the tail in October was about 100,000,000 miles, the width 15,000,000 miles. Its period of revolution around the sun was found to be not less than 3000 years. When farthest from the sun it will be fourteen times more distant than Neptune. The comet of 1843 had the longest tail on record, extending from the head at one time to a distance of 200,000,000 miles, or more than twice the distance of the earth from the sun. As seen in March, 1843, in the northern hemisphere, it extended across the heavens an angular distance of forty degrees, although its width was only about one degree. It was first seen in the southern hemisphere, appearing so suddenly and shining with such great brilliance that it was observed by multitudes and no one person could be named its discoverer. It was not visible in England until several weeks later, when its great splendor had somewhat diminished. This comet is remarkable for its very close approach to the sun, less than 500,000 miles. It belongs to a group that includes the great comets of 1668, 1880, 1882, and the little comet that appeared on the picture of the corona of the eclipsed sun, on May 17, 1882. These comets are spoken of as "sun-grazers" for they all come within half a million miles of the surface of the sun. The elements of their orbits are almost identical, so they must be traveling along nearly the same path. Originally there may have been one great comet mass from which fragments may have become detached because of great disruptive forces resulting from such close approaches to the solar surface.

Donati's Comet of 1858, although believed by some to be less brilliant than that of 1843, was said to be one of the most beautiful ever seen. It was noted for the remarkable envelopes appearing and expanding above the nucleus, then wasting away. Few comets have had a nucleus as brilliant as that of Donati's Comet, which was estimated to have, at one time, a diameter greater than the planet Mars. This comet was noted also for the unusual shape of the tail, which was sharply curved. The tail extended across the heavens a distance of sixty degrees when seen at its best, in October, 1858, and this corresponded to an actual distance in space of about 50,000,000 miles.

The Great Comet of 1861 was believed by some to surpass in splendor those of 1811 and 1858. Envelopes such as were observed in the case of Donati's Comet sprang from the head of this comet, appearing and disappearing with much greater rapidity. The nucleus was estimated to be as brilliant as a small planet viewed through a slight haze. The tail extended at one time to the great length of eighty degrees, and it is believed that on June 30 the earth passed through it. There was noted on the (Continued on page 498)

Space Travel

By IRENE STANLEY

Tonight my thought goes not to Mars,
To Neptune, Venus, Mercury—
Not one of those two billion stars
Vouchsafed the eye of man to see
Contained within our galaxy.

The star-clouds of the Milky Way
Spell-bind my gaze, that wandered free
Among the planets till today.
Aghast, I learned how nebulae
Hide *twoscore billion* stars from me!

Camera Trails

By EDNA HOFFMAN EVANS

A "Camera Trails" correspondent, himself an ardent bird lover and conservationist, recently got the following off his chest regarding group efforts at the conservation of ildlife and natural beauty when he wrote:

"There are oodles of conservation groups and in the aggre-te they have done much good . . . but they are content to ve a few battalions at Dunkirk and have no plans for a land-g at Normandy. . . . Mostly they get together and preach to ch other, whirling around and around like the nebulae in ldereal space—light-years distant from the general public they ink they're converting. That's not the way a new tooth paste put across, or a war, either."

Sometimes it seems that way. Sometimes, in the face of the llous indifference of the general public, it seems as though the nservation battle is a hopeless one. It is like the boy we saw south Georgia recently, lighting matches under a toad, just r the fun of it (we rescued the toad), or the woman who tears wildflowers by the roots, only to drop them a few minutes ter when they get wilted and "messy," or the family picnic roup that gaily scatters paper plates, tin cans and garbage round over a previously immaculate bit of woodland.

But, somehow, the real conservationist keeps on slugging way, doing what he can to repair the damage, and to prevent ore. The battle is not entirely lost as long as there is one erson left who can see and appreciate beauty—who can ad-ire a wildflower and leave it to grow, who can camp in the oods without building his fire against the trunk of a living ee, who can listen to a bird's song without banging away ith a rifle or shotgun, and who can see a family of raccoons long a creek bank without setting a trap to catch them the ext day.

The Nature photographer, to our way of thinking, is a real nservationist. He records on film, and saves, for future use nd enjoyment, intimate glimpses of Nature—be it a bird, a lower, a stony brook or a fluffy bit of cloud.

Pictures are worth many words, so the saying goes, and, since ach Nature picture is a little conservationist sermon in itself, ve think organizations that plan exhibits, contests and displays f such are especially worth while. We hope some "Camera rails" readers will take part in them, and will organize others f their own.

This picture of an Imperialis larva was taken by R. L. Coffin of North Amherst, Mass., and was one of the prints accepted by the Chicago international exhibition.

Hobart V. Roberts of Utica, N. Y., took this picture, which he named "Three Little Tails." It was displayed at the Second Chicago international exhibition of Nature photography.

Take the Nature Camera Club of Chicago, which has for its aim—we quote from the letterhead—"to make the naturalist a better photographer; to make the photographer a better naturalist."

This organization has announced its third international exhibit of Nature photography, which will be held during February of 1948 at the Chicago Natural History Museum. There will be divisions for prints and color slides, with classifications in each for plant life, animal life, and general (all other Nature subjects). Medals and ribbons will be awarded in each classification. Deadline for entries is January 7, 1948, and entry forms may be obtained from Miss Louise Broman, 6058 South Troy Street, Chicago, Ill.

The following month (March, 1948) another organization, the Southeastern Chapter, Michigan Association for Native Plant Protection, will sponsor the Second Michigan Salon of Native Wildflower Photography, which again will be hung at the 1948 flower show in Detroit. It was estimated that 160,000 persons attended the 1947 show, and even greater crowds and better displays are expected for the coming one.

This photographic salon will have two divisions, one for monochrome and color prints, and another for slides. Suggested subjects include: "wildflowers—foliage and fruit; native shrubs—flowers and fruit; native trees—flowers and fruit; native grasses—flowers; sedges, rushes and the like; in situ or still life." Entry forms may be obtained from the salon committee, of which the Chairman is Roger E. Richard, 1832 North Gulley Road, Dearborn, Mich.

Since we mentioned, in a former section of "Camera Trails," the third annual Dassonville Print Competition, we can now run a follow-up reporting that a total of 2920 prints were entered by 788 photographers and camera clubs, representing forty states and nine foreign countries. While the contest was a general rather than a Nature picture competition, shots of Nature subjects figured prominently among the winners. Winner of the grand award, titled "Fog at Gloucester," also entered the "Anthurium" print included in this section's illustrations.

While we have not heard definitely, there doubtless will be a fourth annual competition in 1948. We will pass along the information when we receive it.

LETTERS

We have received several interesting letters (just as we hoped we would) about the compur versus focal plane shutter speed we mentioned in our May section. Several readers sharpened their pencils, did some figuring, and then wrote us.

While agreeing professionally with our opinion that a second is 1/60th of a minute, no matter what kind of a clock it is

This "Anthurium" picture, taken by Gottlieb A. Hampfler of Philadelphia, was given honorable mention at the Third Annual Dassonville Print Competition. Hampfler also won the grand prize with another picture.

recorded on, Alfred M. Kramm, a jeweler in Grass Valley, California, wrote as follows:

"A lot of the focal plane shutter's speed is gained by its ingenious mechanism, so that what counts is not only the actual speed with which it moves, but also the actual size of the slot in the curtain that moves by the film. In other words, several or rather many types of exposures could be produced by one speed, simply by opening or narrowing down the width of the focal plane shutter slot. . . . It may therefore be true that the actual speed of movement of the shutter has changed but little when the camera is set at a higher speed. What really happens is that only a very small part of the film across its full width is exposed at a time while the narrow light slot of the shutter curtain passes by."

On the same subject, from across the country, came another very interesting and illuminating letter from Arthur Palme of Pittsfield, Massachusetts, complete with formula for those who like mathematics. Wrote Mr. Palme:

"Strange as it seems, the answer to the question 'Is a focal plane shutter at 1/1000 really faster than a compur shutter at 1/400?' is 'No' and 'Yes.' The compur, like all between-the-lens shutters, opens and closes the lens to make the exposure. The actual time between the instant the leaves of the shutter begin to open, to the last pinhole just before they close again is, on good shutters, nearly what the speed dial reads, often a little less. The exposure is, therefore, 1/400 sec.

"The focal plane shutter is a horse from a different garage. It does not uncover and recover the lens, but it slides a narrow slot in front of the film while the lens is open. For a so-called 1/1000 sec. exposure, the slot is ⅛ inch wide and the spring tension which causes the shutter to move is a maximum. With this maximum tension, it takes the slot just 1/30 sec. to travel the width of the film. Each ⅛ of the 4-inch high film (4 x 5 camera) receives an exposure of $\frac{1}{(4:\frac{1}{8})\times 30} = 1/960$ sec. While the individual strips of the picture do receive each an exposure of about 1/1000 sec., the finished negative represents actually 1/30 second of action.

"If the action photographed is very rapid, the object may have moved appreciably during the 1/30 sec. and noticeable distortion may be found on the negative. For example, a broadside view of a speeding auto, taken at fairly close range, will show elliptical wheels, with the long axis of the ellipse tilted forward. A golf club, caught in the midst of a swing, will have a decided bow in it, and a revolving flywheel will have bent spokes."

He concludes: "Considered as an integrating device, the 1/1000 sec. focal plane shutter is more than 10 times slower than a 1/400 sec. compur, but the resulting individual phases of the picture, each considered by itself, are more than twice as fast."

So much for the complicated mechanisms of high speed cameras.

In defense of lesser breeds (lesser by way of cost, if not in performance) we have received a note from New Yorkers David and Violet Breck. They also inclosed a nice head-on photograph of a shark. Wrote they:

"Our poor little camera cost $1.39 and has no pedigree of 'F's' and thousandths. It knows no such luxuries as screens, filters nor hoods. Would a camera which cost 100 times as much, take a picture 100 times better? If not, it would not be worth the price. We claim that expensive cameras are only for those who take no pictures except of running deer in the rain, during total eclipses."

And, we will admit, the Brecks definitely have made a point.

Still, we maintain our stand that the photographer who gets the best equipment he can afford, and who then learns to use what he has to the best advantage, is the fellow who is most apt (barring accidents, happenstances and acts of God) to get the best results.

There is no one camera that can do everything—although some of them can come mighty close, when provided with a lot of extra gadgets, such as auxiliary lenses, filters, and the like. Anyone who has ever attended a Camera Club meeting, be it in Nome, Alaska, Ogallala, Nebraska, or some place in Patagonia, knows it is next to impossible to find any two photographers who will agree on anything—be it choice of camera, type of developer, grade of paper, adjustment of lighting, method of focusing, angle at which to hold exposure meter, or seventy-dozen-and-one other debatable photographic topics.

In the long run, it is every cameraman for himself.

We thoroughly enjoyed the above letters, and others on assorted subjects. We hope "Camera Trails" readers will keep on writing them—or will begin, if they have not already done so.

Teaching Films

Release of two new kits of discussional slidefilms is announced by The Jam Handy Organization, 2821 East Grand Boulevard, Detroit 11, Michigan. One, with seven discussional slidefilms, is entitled "The Sky," the other, with six slidefilms, is entitled "Matter and Molecules." Full details will be sent on request.

Old West in Picture

Picture Maker of the Old West. By William H. Jackson. New York. 1947. Charles Scribner's Sons. 308 pages. 393 photographs, sketches and paintings, with end maps. $7.50.

William Henry Jackson was the dean of American photographers when he passed away in 1942 at the age of 99. The years of his life paralleled the development of photography, and it is our good fortune that he devoted his photographic talents to the West in the years of its development. Not only did he train his lens upon the western scene, but when his camera was not available he made pencil sketches and paintings of events. We are now indebted to his son, and to his publishers, for one of the most fascinating volumes of the day. With brief text and captions, drawn in large part from his father's diaries, Mr. Jackson has carefully compiled a pictorial history of the old West. Scribner's has given it beautiful physical form in a volume, large-sized, to cherish. Among the pictures are the earliest to be taken in the Yellowstone, pictures that had a great deal to do with the setting aside of this area as the first of the National Parks. Indians, railroad building, mining, exploration and other phases of western expansion are recorded. It is particularly appropriate that, coincident with the appearance of this book, the museum at Scotts Bluff National Monument will be expanded by the addition of the William H. Jackson Wing, made possible through special gifts, largely from Julius Stone, a friend of the pioneer photographer.

R. W. W.

Maryland-D. C. Birds

Irving E. Hampe and Haven Kolb have collaborated to compile and annotate a booklet entitled "Preliminary List of Birds of Maryland and the District of Columbia." It is brought out by the Natural History Society of Maryland. The booklet is not intended to be definitive but to serve as a stimulus to further studies and more complete compilation.

The School Page

By E. LAURENCE PALMER

Professor of Nature and Science Education, Cornell University, and Director of Nature Education, The American Nature Association

DECISION

ANY work in the science field calls for the making of decisions. Is this thing hard or soft, acid or basic, living or dead, here or there, good or bad? We have come to know that in science our decisions must be more or less temporary, subject to revision when additional evidence is available to us. But we do recognize that our philosophy, whatever it may be, must be supported and continue to be supported by evidence that confirms whatever conviction we may have reached?

This task of making decisions so essential to the science field is not of the same type followed in some other fields. Emotion, tradition, personal preference and opportunism have little to do with the determination of the validity of a scientific principle. Unfortunately these considerations too frequently assume unwarranted importance in the field of politics, education, religion and, I am afraid, economics.

Because of these differences, it seems essential that training in the scientific approach, which characterizes, or should characterize, science in the schools, must emphasize the repeated making of decisions by the individual learner, not by the teacher or by some other outside authority. To be sure, such a system may be expensive in the matter of time, because not all pupils will make the same decision, and one or the other must be right. It may take time to go back and help those who err to see the things as they are, but this is really not lost time. Last summer I let one of my classes spend two solid hours trying to form a generalization, without my help, as to the positions in which woody plants bear fruits, and another two hours on finding out how grass plants elongated. The only assistance I gave them was in now and then asking questions that helped them see mistakes in decisions they had made. I deliberately avoided asking questions that might result in their merely confirming an observation of mine. I saw one of those students two months after those experiences, and he said that those four hours were among the best he put in during the whole summer. Certainly they were not wasted, and most assuredly they led to some of the students discovering how, to a slight degree, they might learn how to question the validity of any decisions they might make on their own.

When we stop to compare this technique with the techniques so frequently followed and so essential to success in other fields of endeavor, we come to realize that somehow science has something of a sterling quality not normally found elsewhere. The technique of many salesmen is that of covering up defects in the product being sold, or of failing to mention them, at least. I have been reading a book recommended by a friend of mine. It bears on the cover a serial number indicating that it has been sold by the million. It is *How to Win Friends and Influence People.* It is intriguing, but, to my way of looking at it, it is extremely shortsighted. Possibly by following the recommendations made one might make a temporary friend and influence a few persons, or, maybe, many persons, but I am afraid it will never help one win the tried and true friend.

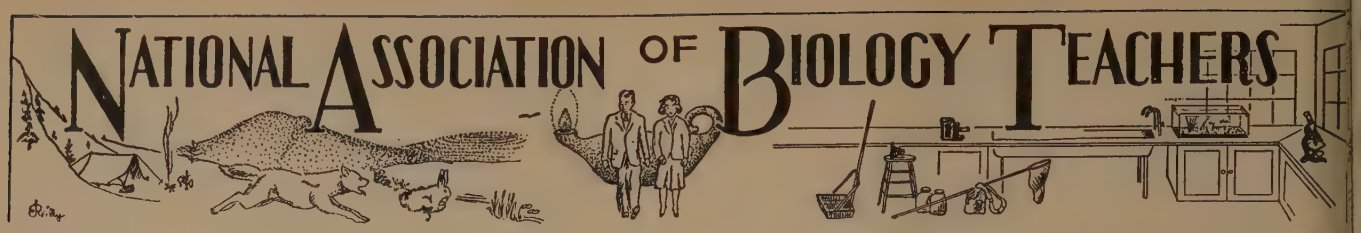
Should I decide to follow the system recommended in this book I would deliberately represent things many times for the purpose of winning a decision in my favor at the time. This, I contend, is essentially dishonest. It usually produces, on the person using the system, the smart aleck smirk worn by the author of the book as shown by his picture on the front. There will be those who will differ with me on this. They will say that the book does what it says, namely, it helps you influence others. But that merely gives power to the charlatan, the crook and the demagogue. About the only way in which such gentry can be exposed is to compel them to face the critical type of person who should be developed by practicing the methods of scientific procedure. Sure, the fellow smiles when he comes to you with this or that, but what is behind the smile? Certainly to a chicken the sound of corn shaken in a pan sounds good, but what about that axe near the bearer of food? Of course the car has a fine polish and runs smoothly, but what about similar cars that have taken the beating of the highway for a few months? Of course if America does not help western Europe the people of that area will be tempted to turn to communism, but what will that get them in the shape of the opportunity for development they may be seeking? Anyone wants to see taxes reduced, but how can that be done if we want to reduce the national debt? Most persons do not want war, but how can it be prevented by those who are not prepared to meet the aggressor effectively and promptly?

No, life is just a matter of making decisions, one after another. No matter how much we may wish to do so, we cannot avoid making them. Presumably we in a democracy do not wish to avoid making our own decisions, though sometimes it is difficult to believe that this is so. The alternative, of course, is to let someone else make our decisions for us!

In some science work, we find the common practice is to arrange activities that merely confirm a generalization. This is little more than voting *Ja.* Teachers have been known to "dope" experiments to make sure that the results accord with what the book says, or with what they are supposed to be. Some of our overly organized field trips smack of the same type of regimentation. We go through a woodlot, a filter plant, an industrial concern or museum and fill out our work-books in the typical lock-step manner. Such a procedure makes the looking over of reports relatively simple, but it does not to any appreciable degree represent independence of thought or method.

Would it not be better if we tried, for once, to do a little less and do that well? Can we not let children of any grade learn to make decisions of their own? They may have to modify them later, but that does not violate the principle of the scientific method. Maybe, because of force of circumstances, we do have to marshal some activities for the sake of getting easily comparable records as a basis of some grades, but please let us reserve some time for freedom of activity, some opportunity for independent decision, some chance for individual growth.

This next month will be an election month when all of us will be forced to make some decisions based, I hope, on our experiences. At the other end of the month we will set aside a day for thanksgiving. Children in our classes may be called upon to make independent decisions on a problem of common interest just as we will have to decide on who shall represent us in solving important social matters for the next year or so. We hope that our schools will not follow a system that is so completely mechanized that we think we can turn out a uniform product when we use fundamentally different materials. It is just not in the cards that we shall ever have people whose interests, abilities, convictions and heritages are identical. It is in the cards that we can, with care, integrate the differences to be found in our citizenry to the end that we may continue to be the envy of the world. We cannot do this by suppressing the right of those who differ with us to express themselves. I happen to be a teacher who does not believe that the joining of a teachers' union strengthens my professional influence or my economic future. I am a Legionnaire who does not believe that communists should be denied the right to vote. You, too, are each of you a member of some group to whose general ideal I hope you do not completely conform. I try to let my students retain their individuality by giving them freedom to come to some decisions of their own. I would rather that they would get the habit of making decisions, right or wrong, than of never making any decisions for themselves. I rather think that if this ideal can be kept in mind, in school and out, we may have some reason to be thankful that we live where we do in this world of ours.



CAMPING EDUCATION

By DOROTHY MILLER

Iowa State Teachers College

CAMP is a wonderful experience! To wake to bird calls all around you; smell the smoke of the fire; watch the sun set from the nearest hill; feel the pull of water against the body or a boat; hear the songs of the campfire and watch the coals dying; wander with a pal down a secret trail; watch the squirrels gathering their winter food; be a part of the great out-of-doors; share in the active busy life of the group—this is camp to thousands of children every summer.

What tales they have to tell to the stay-at-homes when the summer is over! How the mice ran over the tent roof. How one day a skunk wandered into a tent. How the canoe-trippers forgot their tents and it rained every day that they were gone, but what a wonderful time they had. How on the cook-out someone forgot the salt, but how grand the food tasted in spite of that. How the team won the war canoe race. How the cabin had the best stunt for the party. How the chipmunks were so tame that they would climb into a pocket for food. How beautifully sad and impressive was the final campfire and parting. Such wonderful memories! And next year—

But what of the stay-at-homes, envious and unhappy because they know camp only by the reports of others? Is there to be no opportunity for them to experience all of these things? Yes, it is coming, slowly, as all new ideas develop, but surely, as have other new methods in education. For them the school camp can open the door to that wonderful camp experience. It is the dream of advocates of school camping to move the whole class to camp for a week, two weeks; let the children learn at first hand how to select the materials and build a fire, and cook an outdoor meal; see the stars bright at night; realize the value of the soil; see how interdependent are plants and animals; share in the chores and learn to become a part of the group.

But why should the taxpayers send children to camp? Why should they pay for "fun"? Children are sent to school to be educated. What is the value of the camp experience as education? From the viewpoint of the camper, camp is fun. That is the primary attraction. From the viewpoint of the educator, camp can be much more. However, one of its educational advantages lies in the fact that it *is* fun. Camp can supplement the classroom activities, can give stimulus to them, can offer an opportunity for learnings that are impractical or impossible in the classroom situation.

What are the values of a camp experience in educating a child? We have few objective studies of what a camp experience does for a child. But many opinions have been expressed by camp leaders and the parents of the campers. These give some indication of the values of camping in the education of a child. Among the most easily recognized and measured values of a camp experience are the skills and knowledges that the child gains. True, some of these skills and knowledges can be acquired in a classroom, but many are more effectively acquired in the camp situation. Among such skills are facility in the water sports, or other sports that are justifiably a part of the camp program; skills in outdoor living techniques, fire-building, cooking, care of a tent, sanitation; skills in the use of the tools of the camp, the ax, the knife, the saw; and skills in caring for himself, his clothing, and his equipment in various kinds of weather. Among the knowledges acquired more easily in camp are a knowledge of Nature and natural phenomena, at all times of day, in all seasons of the year; knowledge of the basic health needs and a recognition of the need for obeying the health rules; a knowledge of the sanitary needs of the group and how these needs can be met; knowledge of the problems faced by the early settlers; integration of the knowledges acquired in the classroom in the solution of the immediate problems of the camp life.

Among camp leaders we find great emphasis on the ability of the camp to aid in the development of the character and the social adjustment of the individual. The claims for the value of the camp experience in the development of character vary with the enthusiasm of the speaker. By some it is claimed that all desirable character traits are improved in camp. Others will admit that in some situations the development of undesirable traits occurs. Character traits can be improved if the camp leaders consciously try to develop this phase of camping. More concrete evidence for the development of better social adjustment of the individual after a camp experience is found is some of the studies that have been made. To the counselor who knows how to handle groups and group pressures, the opportunity of helping the child make needed social adjustments is great. This is much more readily accomplished where the group lives together.

The camp situation offers many opportunities for the children to have some definite experience in democratic living. In the groups in which the children live it is easier to see how the democratic process works. When some member of the group shirks his share and the others have to do extra work, the necessity for the cooperation of all, and for all to share, becomes rather obvious. When the representative of the group on the camp council is influenced in voting by other than the interests of the group, the need for careful selection of the representative becomes apparent. These small scale trainings later can be transferred to the larger scale of citizenship.

Having accepted the values of camping as indicating that all children should have a camp experience, through the schools if possible, many questions about the school camp arise. How shall the campers be housed? What activities shall be conducted at the camp and what at the school? How shall the program at the camp be planned? Who shall attend the camp? When shall the camp be open? Who shall serve as the counselors? Who shall be in charge of the camp? The answers to these questions will determine the trend of the development of the school camp.

Some would have the camp devoted to the social adjustment of the individual, and let all the other activities be secondary or be ignored. Some would have the camp become an extension of the school playground with all of its equipment. Some would have the camp with a minimum of equipment and allow the campers to experience the thrill of developing the site to meet their needs. Some would have all of the classes moved to the camp with a continuation of the usual classroom approach and scheduling. As the school camp develops these special views must be reconciled and integrated.

Fortunately, some can see the possibilities and limitations of the camp situation and are attempting to develop recommendations that may bring a balance to the program. The National Association of Biology Teachers, through its camp committee, is one of these groups. In the light of present experience the recom-

Christmas Cards and 1948 Gift Calendars

These small Wild Flower and Bird calendars offer an opportunity to secure a most unusual Christmas card. The cover page is devoted to a color illustration and a Christmas greeting. The next 13 leaves make up an attractive calendar with a separate color picture for the calendar cover and each of the 12 months. This Christmas card will prove a useful and appreciated gift and will serve as a daily reminder of your interest throughout the coming year.

WILD FLOWER CALENDAR

Reproduced in full color from paintings of Kathleen Cassel. Fourteen different flowers, size 3½ x 6⅛ inches.

AUDUBON BIRD CALENDAR

Beautifully reproduced in full color from the first edition elephant folio of the BIRDS OF AMERICA by John J. Audubon. Size 3½ x 6⅛ inches.

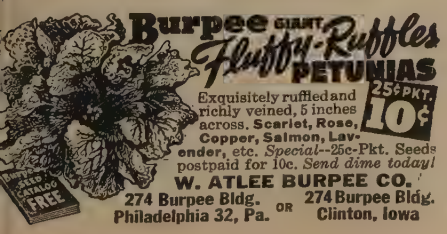
6 Calendars
6 Matching envelopes **$1.00**

(Packed in an attractive box)

Specify Calendar desired and order from

AMERICAN NATURE ASSOCIATION

1214 16th St., N.W.
Washington 6, D. C.


Burpee GIANT Fluffy-Ruffles PETUNIAS
Exquisitely ruffled and richly veined, 5 inches across. Scarlet, Rose, Copper, Salmon, Lavender, etc. Special--25c-Pkt. Seeds postpaid for 10c. Send dime today!
25¢ PKT. 10¢
W. ATLEE BURPEE CO.
274 Burpee Bldg. Philadelphia 32, Pa.
OR
274 Burpee Bldg. Clinton, Iowa
SEED CATALOG FREE

mendations are:

Housing. The campers should be housed in small groups as simply as possible with regard to the weather and the time of year that the camp is to be used. If the camp is to be used only in the spring, summer and early fall, non-permanent shelter would be the preferable type. If the camp is to be used in the winter the housing must be of a type to keep the group warm. In either case, facilities should be available to allow each child experience in primitive camping.

Selection of the activities. Those activities that can be taught in the camp but not in the classroom, or can be more effectively taught in the camp than in the classroom, should be the program of the camp. The criterion for deciding where a certain learning or activity should take place would be where it is the most effectively done.

Program planning. The camp program seems to be more effective when the campers aid in the planning of the activities, and when the program is problem-centered. The program should center about the life in camp, using the tool subjects to solve the problems that arise. Apply arithmetic in calculating the amount of food needed for the group, or the load that a canoe can safely carry. Apply composition in trying to express the feelings aroused by the camp experience. Call on the science to explain the weather, to identify the plants and animals, to lead in any conservation practices.

Who shall attend? It appears that fifth and sixth graders gain the most from the camp experience. The program should probably be introduced with them. Later, all of the classes above this should have the privilege of using the camp when it can effectively supplement the classroom.

When shall the camp be open? Year-round camping would be best. During the school year, the children could be taken to the camp in class groups as the experience fitted their school program. During the summer other groupings could be made. A child should have some camp experience at all seasons.

Counselors. To be effective the counselors need to know how to camp, how to handle children in camp, and to like to camp. If the teachers have these qualifications, they would be effective counselors. Otherwise there should be special counselors who remain at the camp as each group comes.

As school camps develop and experience with them accumulates, these recommendations may be changed to fit the changing knowledge. However, in the light of our present experience these seem valid.

Camp is a wonderful experience! May the schools soon make it available to all of the children!

DREER'S

"Serving Gardeners for over a Century"

Fall Garden Book

WRITE FOR YOUR FREE COPY TODAY

DREER'S
HOLLAND TULIPS
100 Bulbs $6.85

All top-quality imported Darwin tulips in this mixture. Plant this Fall for riotous Spring colors.
50 bulbs $3.50; 25 bulbs $1.85

Giant Spring-Flowering Bulb Collection

52 Imported, best quality **Bulbs**

12 Daffodils
12 Tulips
4 Hyacinths
24 Crocus

Only **$2.95** Postpaid

HENRY A. DREER, Inc.
165 Dreer Bldg., Philadelphia 23, Pa.

PAINT LANDSCAPES

ANYONE CAN DO IT!

LEARN NOW AT HOME. You don't have to know how to draw. Paint your own beautiful landscapes in oil according to expert instructions. Every step explained.

SEE WHAT YOU GET!

Set of oil paints in wood box, 6 panels, brushes, 6 colored prints, palette, 6 sets of instructions, 6 criticisms, plus other materials. **ALL FOR ONLY $19.87.** Can't be beaten. Mail money order NOW or send for free information.

COURT ART STUDIOS — Dept. 117N
P.O. Box 390 — Alhambra, Calif.

A GROWING

English Holly Tree

Let Holiday Cheer Live thru the year

These lovely little trees brighten your window throughout the year or add charm to the memory garden of a friend. Your choice of silver edged variegated as illustrated or the true old-fashioned green English variety. Height 8 to 12 inches, potted in Oregon soil and packed in unique box that insures their safe arrival. Either variety $5 prepaid.

Every year mature holly trees on the Brownell Farms produce a new crop of berried sprays to gladden your home at Christmas time. Packages filled with berried sprays, or a beautiful wreath and sprays are available for gifts and home decoration. Order now . . . also write for illustrated catalog in full color.

Brownell Farms, Box 73-N, Milwaukie, Ore.

Berried Holly Sprays . . $2.50 to $15
Holly Wreaths with Sprays . $5 to $15
Living Holly Trees (green or var.) . $5

Brownell Holly

OUR OLYMPIC NATIONAL PARK

(Continued from page 460)

Selective logging on steep mountain terrain is only a phrase. It is not practical. The timber has to be got out by high lead, dragging down all the smaller timber. So the only kind of "selective logging" practical on steep terrain is bloc-selective logging, that is, clear-cutting certain areas. On comparatively level ground tree-selective logging is possible. However, it would remove the timber that now perpetuates the forest. These trees are in their prime at three to five hundred years of age. They could not be reproduced in five hundred years on the same ground if it were selectively logged, because their "fertilizer" would be gone. Besides, logging enormously increases fire hazard and fire destroys the humus. As Irving Clark says in *The Living Wilderness: "Any logging in the Olympics region involves the destruction of the forest."*

The forest is not trees. There is nothing on earth like the virgin primitive forest of the Bogachiel and the Hoh. You enter a green-gold twilight roofed nearly three hundred feet overhead by blue-green fir and spruce limbs. Closer above you is the dull-gold mezzanine floor of the forest, gnarled maples a hundred feet high, whose long limbs and trunks are aërial gardens of moss and fern. Around you the vistas are curtained into glades by rugs of hanging moss tossed over the wickets of vine-maple limbs. The lounges are logs upholstered with finger-deep moss. Each glade is floored with moss or with delicate, white-starred herbage untoughened by grass roots. Walk across it once and a person can track you. Walk over it four times and you leave a brown trail. Here and there a great silent column of fir or spruce plunges straight into the earth or rests on bronze-mossed arches from under which a log has decayed. In the soft green-gold light a deer freezes to watch you pass. A brown-hooded elk springs away startled, as you come around a log so high it concealed her. On the trail the bear, the marten, and the cougar have left fresh tracks.

These elfin, dreamlike forests belong to you and me, to all the people. You cannot save a "sample" of them. A thousand-acre wilderness is a contradiction in terms. These virgin, primitive "rain-forests" are a web of interwoven life. And they are themselves the indispensable fringe and support of the larger web, a glimpse of whose center so delighted John Clise and his family up on Hurricane.

The Olympic National Park is unique in that elevation is gained so quickly from salt water, and that this comparatively low elevation—Mt. Olympus is only about 8000 feet—springs almost abruptly from green timber into glacial alpine terrain. It is unique in the possibility of becoming a perpetual, complete, self-sustaining biotic community. It is unique in its forest, which is unique in itself on each river bottom. The Elwha is different from the Hoh, the Hoh from the Bogachiel, the Bogachiel from the Quinault, that from the Queets, and the Queets from the Hamma Hamma and the Soleduck, making a variety of unique timber conditions and stands.

The wilderness is not scenery. It is a home, the home of the wild animals, in natural adjustment and interplay with rocks, storms, trees, and each other. The interplay of these various factors in their primeval state is a scientific laboratory of the utmost and increasing scarcity value. Above all, it is valuable to one's feeling of well-being to know that these things exist, as we receive value just by knowing the great art treasures of the world exist, even if we never see them.

THE PLATYPUS AT HOME

(Continued from page 463)

are still living happily in their platypusary at Healesville.

Perhaps the best way to sum up the queer attributes of the platypus is to quote from a quaint verse-sequence that Harry Burrell (no mean perpetrator of light verse) once achieved. Here is a taste:

O, thou prehistoric link,
Kin to beaver, rooster, skink,
Duck, mole, adder, monkey, fox—
Paleozoic paradox.

Adult female, spurless quite;
Teatless udder . . . contents white;
Egg-producing, capsules soft;
One to three, but two more oft.

Ear and eyelids all in one;
Young have true teeth, adults none;
Snarl like cheeky pups at play;
Bite like gander when at bay.

Study those verses and you will have a good idea of the general freakishness of Australia's "Paleozoic paradox" that has come up from the Dawn of Creation to a place in the New York Zoo.

Just a few words more, and these in answer to inquiries from America:

Platypuses are still fairly numerous in certain streams of eastern Australia—they used to be killed for their fur but are now protected both by governmental decree and the force of public sentiment—but because of their shyness and largely nocturnal habits they are not often seen in a state of Nature. Most Australians know them only from seeing them in the Healesville Sanctuary and the Melbourne Zoo.

There are no platypuses anywhere outside Australia except those now in New York. Authorities of the London Zoo talked of trying to get some before the war, but switched to koala bears, and, not being able to obtain those, missed on both counts. Later—during the war—a living platypus was sent to England by sea at the request of Winston Churchill; it did reasonably well until within a few days of England, and then its nervous system collapsed through the repercussion of depth-charges dropped to combat a submarine.

LOUISIANA LIVE OAKS

(Continued from page 466)

memory in a cemetery there, neighborhood tradition persists that he came to the end of his earthly trail in Louisiana and was buried under the live oak at Grangeville.

At the ancestral home of the Lestrapes, whose forebears came directly from France to settle in the Opelousas country, is a group of live oaks called the Seven Sisters. Although the name remains, the trees now number only six. They seem to spring from a common stock as they bend upward and then downward in wide arches.

Lafcadio Hearn, in *Chita, a Memory of Last Island,* writes of the tropic storm that swept the island clean on August 10, 1856, and mentions a few somewhat scrawny live oaks that clung to the margin of the low beach, each bending away from the pitiless Gulf, grim token of their many battles with the winds.

It is not strange that poets have written of the Louisiana live oaks and that artists have put them on canvas. The late New Orleans artist, Drysdale, working in water colors, usually set a great live oak in the foreground of a landscape dreamy with moss-hung trees and sluggish bayous. His pictures were in great demand. Now that the master hand is still, they have acquired a large value.

How old is the largest live oak? No one knows. The researches of Dr. Stephens led him to dispute that such a tree is a Methusaleh. But, looking upon any of the giants of the Gulf region, one would imagine it has been standing for a thousand years. Generations are sleeping under the shadows of the live oaks, and the living native is assured that his loved oaks will be seen on the horizon as long as there is a Louisiana.

For Dahlia Lovers

Dahlias: What Is Known about Them. By Morgan T. Riley. New York. 1947. Orange Judd Publishing Company. 213 pages. Illustrated. $2.50.

The title of this little book is rather fully descriptive of its contents, and appears to cover what is known about dahlias as fully as one can imagine. It will find wide acceptance with specialists in these showy blooms.

Telescopes for Amateurs

Through the years one of the most popular features in *Nature Magazine* has been our regular astronomy department, and the number of amateur astronomers among our readers is considerable. In the past we have been somewhat at a loss as to how to answer inquiries for recommendation of a high-quality telescope for amateur use. We have now discovered the source of a good three- or four-inch telescope with lenses of perfect quality optical glass, the instrument fully corrected for chromatic and spherical aberrations. The three-inch model has eyepieces of 45, 90 and 180 power, while the four-inch instrument has 60, 120 and 240 power eyepieces. Included is either a star diagonal, or prismatic inverter; a permanently mounted, low power finder with crosshairs; a five-foot hard maple tripod. The same source also manufactures a 20-power, draw-tube telescope and a 20-power, prismatic type telescope. Any interested amateur astronomers may receive full details if they will write to the Astronomy Editor, *Nature Magazine*, 1214 16th Street, N.W., Washington 6, D. C.

THE SILVER BALL

By AMBER BALDWIN

One summer evening my daughter, Dale, and I were sitting near the lake shore, watching the damsel flies winging from one bit of pond grass to another. Several days later, when Dale's father came to the lake, Dale told him about the damsel flies. Her description seemed so well drawn for a child just past her sixth birthday that I wrote it down.

"Daddy," she said, "you should have been here the other night. Mother and I saw two damsel flies, joined together, come to the surface of the lake. Then one of them went under the lake. She was a silver ball, laying eggs in the watergrass stems. Then mother, the mean thing, put her hand in the water and scared the silver ball. Both damsel flies flew away, the one shaking her wings to get rid of the water."

Mineral Key

The Mineral Key. By Howard B. Graves, Jr. New York. 1947. McGraw-Hill Book Company. 178 pages. $4.00.

This valuable little book provides the amateur mineralogist and mineral collector with helpful tables and methods to use in identifying 823 minerals. The tables give the names of the various minerals, their chemical formulas, composition and distinguishing characteristics. The use of the tables is explained, and tests are described which involve only the use of inexpensive chemicals and simple apparatus that the reader is shown how to construct.

New Biology Text

Basic Biology for High Schools. By Carroll Lane Fenton and Paul E. Kambly. New York. 1947. The Macmillan Company. 726 pages. Illustrated. $3.24.

Presenting the fundamental facts, principles, and problems in the science of living things, this new biology provides a modern and stimulating text that can be read with enjoyment as well as provide the high-school student with the means to understand the world in which he lives and how to live wisely in it. This biology textbook presents the essentials of a varied and complex science within the limits of a standard one-year course. The material has been carefully weighed and tried in school work. There is no attempt to make the book both a textbook and a source of supplementary reading, but in their goal of providing a readable text the authors notably succeeded.

Careful of Cans

From Eva Beard of Woodstock, New York, comes warning to be careful about throwing opened and uncovered jars and cans away in the wild. A recent rainy night, she writes, she heard a persistent tapping on an outdoor water pipe. Investigating, she found a young skunk with a glass jar caught over its head, which encumbrance it was trying to get off by hooking it over the pipe. When Miss Beard opened the door the skunk came toward her, having a strange Martian look. She says that she blushes to admit that she slammed the door, only to repent and open it again, finding the skunk padding down the drive. The animal turned and came back to her, thrusting its glass head upward. Miss Beard grasped the jar and the skunk backed out of it and departed, probably gratefully.

Spring Flowers

Flowers That Bloom in the Spring. By Virginia S. Eifert. Springfield, Illinois. 1947. Illinois State Museum. Story of Illinois No. 4. 46 pages. Illustrated.

This booklet contains another chapter in the story of Illinois. It is a story of flowers in their natural haunts, and might well be entitled "Springtime in Illinois" as it follows the pattern of that season, beginning with the earliest spring flowers and closing with those of early summer. There is an intentional absence of scientific data and description, for the Story of Illinois is proposed as an authoritative but non-technical narrative, to develop a sympathetic understanding and curiosity about the world in which we dwell. Read in conjunction with the Illinois Museum exhibits, it is hoped that it will arouse a new interest in the natural endowments of Illinois, birds, rees, ferns, flowers, etc., and introduce an appreciation of the preservation of native plant and animal life for the pleasure of future generations.

AMAZING MAGNET--25c

LIFTS 75 TIMES ITS OWN WEIGHT! NO ELECTRICITY NEEDED.

Outstanding achievement of science, performs many useful tasks in every home, office or shop—easily, quickly. Eliminates tedious chores. Illustrations included with order describe scores of practical, time and labor-saving uses. Price only—25c each (postage 5c), or FOUR for $1.00 postpaid! Satisfaction guaranteed. Stamps accepted. Orders filled within 24 hours.

R. L. EYRICH, 2566 N. 49th ST., Div. "N," MILWAUKEE 10, WIS.

GOLDEN HAMSTERS

The new wonder animals from Syria. Sometimes called Toy Bears. Delightful pets. Everybody wants them. Thousands needed by laboratories. Clean, odorless. Can be raised anywhere. Make money, get started now. Send 10¢ for illustrated literature, or $5.00 for a pair of Hamsters and literature.
GULF HAMSTERY, 1531 BASIL ST., MOBILE, ALA.

FEET HURT?

TRY DR. BARRON'S NEW FOOT CUSHION
Do you suffer from metatarsal callouses, corns, weak arch foot pains? Try Dr. Barron's New Foot Cushions. LIKE WALKING ON A PILLOW! Soft, Spongy, Air-ventilated. Fits all shoes. Cushions your arches and feet from heel to toes. Dr. Barron says: "Wonderful for tired, aching feet!" Send only $1.98 for A PAIR, or C.O.D. plus postage. State shoe size and if man or woman. 30-DAY TRIAL GUARANTEE. Money back if no blessed relief.
ORTHO, INC., 2700 Broadway, Dept. 97P, NYC 25

NEW HELP FOR HERNIA

is the amazing Treatise which explains simple, inexpensive, easy, proven way for curbing your rupture, right at home. This proven way has helped many rupture sufferers quickly. So don't let your rupture get worse. Send for FREE details today. Mailed in plain, sealed envelope. No obligation.

BRADNER PUBLISHING CO.
ESTABLISHED 1933 DEPT. L, DIXON, ILL.

Rheumatism Yields To Drugless Method Of Treatment

Excelsior Springs, Mo.—So successful has a comparatively new, drugless method proven for treating rheumatism and arthritis that an amazing new book will be sent free to any reader of this paper who will write for it.

This book entitled, "Rheumatism," fully explains why drugs and medicines give only temporary relief and fail to remove the causes of the trouble.

The Ball Clinic, Excelsior Springs, Mo., has perfected a system of drugless treatment for rheumatism and arthritis combined with the world famous mineral waters and baths. This new system of treatment is fully described in the book and tells how it may be possible for you to find freedom from rheumatism.

You incur no obligation in sending for this instructive book. It may be the means of saving you years of untold misery. For writing promptly, the company will also include a free copy of the book entitled, "Good Health, Life's Greatest Blessing." Address your letter to The Ball Clinic, Dept. 543, Excelsior Springs, Mo., but be sure to write today.

WHAT IS NEW IN METEOROLOGY?

(Continued from page 472)

in advance, and to help pilots avoid them, two additional radar devices have been developed. These are the so-called MEW (Micro-Wave Early Warning) system, which has a range of about two hundred miles, and a height finder nicknamed "Little Abner."

Working together, the two can guide pilots around bad weather areas, can help them avoid mountains and other obstacles, and, if necessary, can bring them in safely when the ceiling hangs low and normal landing procedures are next to impossible.

Still another method of detecting the presence and path of distant storms is by means of the seismograph, an apparatus more popularly thought of in relation to the recording of earth tremors and earthquakes. This project was started by the Navy in 1943, and studies have been made every year since then, with more equipment being installed at an increasing number of points.

The program is used especially in connection with hurricanes in the Caribbean-Atlantic Coastal areas, and with typhoons in the Pacific. It makes use of the microseisms, which are natural, regular oscillations of the ground, not produced by earthquakes nor by artificial means, such as dynamite explosions or the rumble of big city traffic. Nearly all siesmologists now agree that the ultimate cause and source of these microseisms are meteorological.

Two theories have been advanced to explain them. One theory, first advanced more than thirty years ago, held that the pounding of storm-driven surf against a steep coast was the direct cause of microseismic activity. However, recordings received while storms are still far out at sea, or while a hurricane is still in the process of formation—long before any waves could reach a coast and beat against it—would seem to overrule this theory.

The second theory holds that microseisms are produced by atmospheric low-pressure areas and by strong winds over the oceans. In some manner, not yet fully understood, a low-pressure area transmits, to and through the water to the ocean bottom, enough energy to produce dominant microseisms.

The Navy set up three seismographs, in triangular formation, at its base on Guantanamo Bay, Cuba, in 1943. By comparing the time the microseisms were received at each of the three seismograph stations, the direction from which the wave was traveling could always be calculated. Strangely enough, the microseisms were found to be much stronger when the storm was over deep water than when it was over shallow water or land.

Since the initial work at Guantanamo Bay, other seismograph stations have been established — at Corpus Christi, Texas, in Puerto Rico, on Swan Island, and at several other points in the Caribbean area, as well as at Guam, Okinawa and Samar in the Pacific. Records kept during each of the years since 1943 indicate that the maximum distance at which the seismograph can detect a distant storm depends on several factors, but it is never less than three hundred miles, while it may be as distant as fifteen hundred miles. Generally speaking, a storm can be no farther away than six hundred miles in the Caribbean, or a thousand miles in the Pacific, to be recorded by a seismograph.

While weathermen do not actually need these records of the earth's vibrations to trace storms, every bit of additional knowledge helps when a forecaster is dealing with a hurricane, The study is still quite young but once, at least, the seismograph has detected a change in direction or intensity of the storm before the flying weathermen who were patroling it by plane, or the land based meteorologists who were charting it, were aware of any change. The same has held true at times while storms are in the process of formation.

Thus, in the old days of not so long ago, the weatherman had to be a patient watcher and observer—a reader of barometers and a watcher of rain gauges. Today, in addition to these duties, he must also be an electrician, a radio or radar operator—virtually a super-scientist with his fingers on the pulse of the earth, his ears attuned to radio waves, and his eyes on the upper air.

The question "What's new in meteorology?" is not funny, and it certainly can not be answered in a few words. Even though the weatherman took a week off to explain all the new developments, complete with illustrations and diagrams —the chances are that the layman would be more puzzled, impressed and baffled than he ever was before.

GREAT COMETS ARE FEW IN NUMBER

(Continued from page 490)

evening of that day a strange auroral light in the sky. The comet was then clearly visible through sunshine in the early evening. A phosphorescent glare was noted about the same time by many observers.

The Great Comet of 1882 was remarkable for the fact that the head seemed to undergo disruptions, and the tail appeared to be tubular and split at the end, or forked. The nucleus had the unusual appearance of small, brilliant beads of light strung in line; and finally it was observed to throw off a mass which became a satellite comet. One of the group of sun-grazers, it passed through the solar corona at time of nearest approach to the sun. Since the appearance of this great comet there has been up to the present time only one comet seen that could be considered comparable to it in splendor, that is Halley's famous periodic comet.

On November 12 the swarm of meteors known as the Leonids, which follow in the same orbit as Tempel's Comet of 1866, are due to give their annual display in the early morning hours. This may continue for several days. On November 12, also, there will occur an annular eclipse of the sun. The path of the annulus will pass over the eastern Pacific, and over Peru at and near Talara, and Brazil in South America. Partial phases of the eclipse will be visible over the greater part of North and South America. The northern limit of the eclipse region will pass through Canada and the north-central and eastern states. A partial eclipse of about forty per cent will be observable on the west coast near 11 A.M., Pacific Standard Time, but in Washington, D. C., only four hundredths of the sun's diameter will be covered by the moon at 3:47 P.M., Eastern Standard Time. This will scarcely be noticeable without the aid of a telescope.

The planet Mercury will be in inferior conjunction with the sun November 5, and at greatest western elongation on November 22. It may be seen in the early morning twilight, therefore, the latter part of the month. Venus is now visible low in the western evening sky, improving its position during the month. It will be in conjunction with Jupiter on November 9. Jupiter is now drawing in toward the sun, and will disappear in the sun's rays before the end of the month. Mars and Saturn will both be in quadrature with the sun this month, Saturn on November 15 and Mars on November 17. They will then rise near midnight and be on the meridian at sunrise. The two planets will be in conjunction in Leo, when Mars will pass less than a degree to the north of Saturn, on November 11.

Wildlife Poster Contest

School students from the seventh grade through senior high school are invited to enter a nation-wide wildlife poster contest sponsored by the National Wildlife Federation. A first award of $250, plus a trip to St. Louis accompanied by father, mother or chaperon, will be made. Second, third and fourth prizes will also be awarded. The contest closes February 1, 1948, and the winner will be announced and presented with the first prize at the North American Wildlife Conference to be held in St. Louis in March, 1948. Full details of the contest rules may be obtained from National Wildlife Federation, 20 Spruce Street, Boston 8, Massachusetts.

THE READER'S MARKET

A place where members of the American Nature Association and readers of Nature Magazine may find many interesting offerings or may advertise themselves, at low cost, for things wanted; things they have for Sale, for Trade, for Sale or Trade. This is an excellent forum for acquiring or disposing of such items as binoculars, books, cameras and photographic equipment, magazines, sports and outdoor equipment, etc.

GENERAL REQUIREMENTS APPLICABLE TO CLASSIFIED ADVERTISING

1. *Transactions based on good faith:* Transactions are based on good faith and mutual satisfaction. Deliberate misrepresentation, disregard of usual business ethics or the attempt to circumvent these general requirements, when brought to our attention, will result in refusal of further advertising.

2. *All orders subject to these conditions:* We reserve the right to edit all copy to conform with our standards and to reject or discontinue any advertisement which we consider undesirable.

3. *Who may advertise:* This department is an open market trading post. Any individual or firm whose advertisement and methods of doing business meet our requirements may advertise their goods or services.

4. *Rates:* All classified advertisements must be accompanied by remittance. The rate is 15c per word including name and address—minimum charge $2.00. Cash with order.

5. *How to count numerals, etc.:* Groups of figures are counted as one word. Abbreviations consisting of initials or single characters likewise are counted as one word. Hyphenated words are counted as two words.

6. *"For Sale" ads must state prices:* A specific price must be stated on all FOR SALE ads —except that the phrase "write for catalog" may be used when listing real estate or merchandise in quantities.

7. *Conditions of trade or sale:* The condition of binoculars, cameras, instruments, other equipment useful to outdoor lovers, home-owners, etc., advertised for sale or trade must be specified as follows: PERFECT—meaning factory condition; EXCELLENT—meaning new condition, implying negligible amount of use; VERY GOOD—meaning practically new condition, implying little use, with no appreciable wear and only minor surface scratches or wear; GOOD—meaning moderate condition and with only moderate wear; FAIR—meaning no parts missing necessary to use, reasonable wear inside and out; POOR—meaning marred appearance or badly worn.

8. *Non-specific phrases barred:* Phrases such as "highest" or "top prices paid", as well as any other so-called "auction-type" phrases are not acceptable. The terms "fair price paid" or "state price wanted" may be used.

9. *Blind ads not acceptable:* Box number or blind ads will not be accepted. Give your complete name and address to insure prompt delivery of all mail or telegraph replies.

10. *Requesting privilege of examination:* Purchasers desirous of examining merchandise before acceptance should request shipment by express C. O. D. with examination privilege. This procedure permits the purchaser to inspect the merchandise in local express office and authorizes the express company to return unsatisfactory merchandise at shipper's expense.

11. The association will not accept for publication in NATURE MAGAZINE, advertisements of firearms, ammunition, or patent medicines.

12. *Responsibility for illegible copy:* Type or print advertisement plainly as we cannot be responsible for errors due to illegible writing.

13. *Closing date:* The closing date of all advertisements is the 20th of the second month preceding month of issue.

ANTIQUES GLASS FOR SALE

MOON AND STAR: List for stamp. Forrest Bowers; Doylestown, Pena.

ATHLETIC GOODS

BAR-BELLS, DUMB-BELLS. Exercise equipment, courses. Free catalogues. Good Barbell Co., Dept. N, Reading, Penna.

BIRD HOUSES

BIRD HOUSES: Made of thick cypress wood, with rustic finish for birds likes and needs. Model No. 1 for wrens, chickadees, nuthatches, and downy woodpeckers. No. 2 the same except with larger hole for bluebirds. Easily opened without tools for cleaning and inspection. Send prepaid $5.00. Satisfaction guaranteed. John Logan, 1421 County Ave., Texarkana, Arkansas.

BOOKS

BOOKFINDERS! (scarce, out-of-print, unusual books) Quickly supplied. Send wants. Clifton, Box 1377nm, Beverly Hills, Calif.

SECURE your out of print and second hand books from The Audubon Book Service, 415 Lincoln Ave., Brooklyn 8, N. Y.

NEW FALL BOOK Catalog on birds, mammals, reptiles, trees, flowers, insects, etc., ready for mailing. Send stamp. Fred J. Pierce, Winthrop, Iowa.

BIBLE STUDIES, 70 lessons, 25¢ complete. Bulletin, Box 87-N, Cathedral Station, New York 25.

"BIBLICAL CONFIRMATIONS from Archaeology", 40¢. Christian Evidence League, Malverne, N. Y.

THE WILDCRAFTERS WORLD, a new outdoor living and idea magazine. It's different. Quarterly, $1.00 year, 25¢ copy. Laurence Barcus-N, Terre Haute, Indiana.

MAKE COSMETICS, PERFUMES, soaps, etc. 100 formulas $1.00. M. Elsbury, 717 North Dearborn, Chicago 10, Illinois.

ANGLING, HUNTING, and NATURE books, new, used and rare. Request free list. Sporting Book Service, Dept. D, Rancocas, N. J.

BUTTERFLIES

TWELVE NAMED TROPICAL butterflies unmounted. All different. One dollar. Postpaid. King, 2211 West Fourth St., Duluth, Minnesota.

BUTTERFLIES, WORLD ASSORTMENT, 20 for $2.00. Other materials for sale, free price list. American Butterfly Co., 3457 Park Heights Ave., Baltimore 15, Md.

CAMERAS

CAMERAS—MOVIE PROJECTORS, Enlarger's lowest prices. Free Catalog. Cavalier Camera, 1822 Center Ave., Pittsburgh 10, Penna.

CHEMICALS AND APPARATUS

NEW LABORATORY supply catalog of chemicals and apparatus. Contains over 5000 items with illustrations, 212 pages. Send 50¢. Standard Science Supply Co., 1232 No. Paulina St., Chicago 22, Illinois.

DOGS

PEDIGREED, registered COLLIES. Beauties. $50.00 up. Macanjo Kennels, Dimondale, Mich.

FIELD GLASSES

PRISM BINOCULARS—Finest U. S. Gov't optics. Huge 50mm COATED objectives. Less than half price; 7x50mm $79.50; 10x50mm $89.50; 12x50mm $92.50 plus tax, prepaid. Literature on request. DuMaurier Binocular Mfrs., Dept. 88, Elmira, New York.

TELESCOPES, BINOCULARS, Microscopes,—big bargain, catalog free. Brownscope Company, 24 West 45th St., New York.

HOBBIES

EARTHWORM CULTURE. A fascinating hobby; profitable home industry. Write for valuable free bulletin-review on "Earthworms: Their Intensive Propagation and Use."—Thomas J. Barrett, Earthmaster Farms, Box D-488, Roscoe, California.

YOU CAN ENTERTAIN with chalk talks. Catalog 10¢. J. G. Balda, Cartoonist, Oshkosh, Wis.

LEATHERCRAFTERS! Send for free catalog listing leathers, kits, tools, accessories, Kit Kraft, Dept. N, 3203 W. Washington Blvd., Los Angeles 16, California.

NEW MOVING WEATHER Book and Models. Introducing real hobby. Graphic Flight Series, Clarksville, Tenn.

NEW HOBBY CATALOGUE 10¢. Curios, Biological specimens, supplies and publications. Quivira Specialties, Topeka, Kansas.

LEARN SEA SHELL Jewelry and novelty manufacturing. Beautifully photographed home instruction course showing 110 designs, $1.00. Beginner's Kit, $3.00. Highest professional endorsement. HOUSE OF GIFTS, Box 4550-NM, Coral Gables, Florida.

HOME STUDY

LINGUAPHONE FOR LANGUAGES. At home learn to speak Spanish, French, Russian, German or any of 29 languages by quick, easy Linguaphone Conversational Method. Linguaphone is available under GI Bill of Rights. Send for FREE book. Linguaphone Institute, 73 RCA Bldg., New York 20, N. Y.

MAKE-IT-YOURSELF

WHITTLER'S—Supplies—blanks—special woods—knives. "Old" Whittler, 1402 Charles St., La Crosse, Wis.

"CONCRETE BLOCK HOMES", 32 page booklet drawing, instructions on how to build, $1.00. H. C. Lightfoot, Civil Engineer, Richboro 23, Penna.

MICROSCOPE SUPPLIES

MICROSCOPIC SLIDES. Professional quality. Highly interesting assortment of plant and animal structures. Every supply for the amateur microscopist. Send stamp for catalog. Microlab, P. O. Box 91, Flushing, N. Y.

MINERALS

"ROMANCE IN STONES." Arizona rare minerals. Collectors or museum grade, 12 miniatures, assorted, colorful, brilliant, genuinely rare, $3. Sam Parker, 2160 East Van Buren, Phoenix, Arizona.

MISCELLANEOUS

POWERFUL MENTAL TELEPATHY, Practical. Free Literature. Elgin Johnson, 912 Benton, Nashville, Tenn.

ANY WATCH REPAIRED, $5.00. Replacing of parts, cleaned and adjusted. Work guaranteed and insured. Returned C. O. D. Paullo Bianco, 2015 East 17th St., Brooklyn, N. Y.

MAINTAIN NEW YORK mail address. Your mail received, forwarded. Confidential. Free details. Arlington, 131-N West 42nd, New York 18, N. Y.

MUSICAL INSTRUMENTS

PIANO PRACTICING ANNOYING others? Mayo's muting device easily attached or detached by anyone without harming mechanism. State Upright, Grand, Spinet. Send $5.00 for Mute. Full instructions. (Guaranteed) Richard Mayo, Piano Technician, Dept. 006, 1120 Latona Street, Philadelphia 47, Pa.

THE ROMANCE OF SPICES

(Continued from page 469)

money, and it is said that, in 408 A.D., Alaric demanded that the ransom for Rome should include 3000 pounds of pepper in addition to gold and silver. Of course, the cost in those days was almost entirely for transportation.

There are three divisions of spices: Aromatics, Stimulants and Sweet Herbs. Sweet herbs we can grow in our own gardens, if we choose, but most true spices come from tropical lands. Allspice is the only major spice that comes exclusively from the Western Hemisphere. It flourishes in Jamaica, and is known technically as "pimento," also, confusingly, as "peppercorn."

Ginger did not originate at Jamaica but likes its volcanic soil, hence the name "Jamaica ginger." It is one of the few spices that grows below ground. It once was used as a love potion and was so mentioned in Arabian Nights. Now its more prosaic uses are well known as a flavoring and a base for medicines and soft drinks. The Chinese are very fond of ginger.

Pepper is the leading spice in sales volume, thirty percent of all imports of spice being black or white pepper. White pepper is the same as black with the black coat of the dried berry rubbed off, taking away some of the bite. Pepper berries grow on a perennial, climbing shrub, *Piper nigrum,* that is native to the East Indies, but which thrives today in India, French Indo-China, Sumatra, Java and Thailand. It once was used in medicines, and, in addition to common table use, goes into soaps and perfumes. Paprika, cayenne pepper, red pepper and chili powder come from the dried, ripe fruits of plants of the genus *Capsicum.*

Cinnamon ranks next in volume. It was prized by the ancient Egyptians, and the Jews anointed their holy vessels with cinnamon-scented oils. It is still used in incense burned in Catholic churches and cathedrals. Cinnamon is native to Ceylon, where it is cultivated, and the Malabar coast of India. The cultivated trees are small and bushy, with leathery, bright green, aromatic leaves. It is known as *Cinnamomum zeylanicum* and belongs to the laurel family. It comes to us as a roll of bark known as a "quill."

Nutmeg comes from an evergreen tree, *Myristica fragrans,* the leaves of which closely resemble rhododendron. The fruit is nearly round, yellowish-green and like a good sized peach in appearance. When ripe, it splits open to reveal a kernel, inside of which is the seed, or nutmeg. The kernel is covered by a crimson aril, which is dried and becomes mace. Nutmeg is native to the Spice Islands and is cultivated elsewhere.

Clove, fourth in importance, comes from an evergreen tree, *Caryophyllus aromaticus,* the flowers of which are borne on bunches at the ends of twigs. The clove is the unopened bud, picked by hand when the base of the bud turns red. If the bud is allowed to mature it develops into a large, purple drupe, known as mother of cloves.

Other spices are turmeric, which comes from the perennial rootstock of an herbaceous plant, *Curcuma longa,* and is used in the manufacture of cheap mustard; cassia, a bark similar but not as aromatic as cinnamon; ginger, the root of a herbaceous plant, *Zingiber officinale,* of tropical Asia. Cardamon, caraway, coriander, mustard, cumin, dill, fenugreek and fennel are all aromatic seeds, some native to or now cultivated in Europe and elsewhere.

A great many spices and herbs of various sorts are used in the flavoring of cakes, cookies, curries, meat sauces, mixed spices, bitters, liqueurs and cordials. Some of the formulae for these various products are trade secrets held by an individual firm or family. But almost all contain such spices as anise, caraway, cassia, fennel and sage. Pickle seasoning and poultry dressing also call for certain combinations of spices and herbs. Indeed, our holiday feasts as well as our everyday meals would be drab indeed without the aid of these pungent combinations of subtle and spicy flavors. And what would milady's toilet be like without their presence in soaps, toilet lotions and other cosmetics?

Today we do not hear so much about the medicinal value of spices, but they are still widely used in drugs and patent medicines. Their healing value is better understood, but perhaps not so much appreciated as in days of old, when medicine was more of an art than a science. Take the story of the four thieves of Paris, for instance. In 1720 when the Black Plague was ravaging France, four brigands went about unafraid, robbing the dead and dying. When caught at last, their sentence was lightened when they agreed to tell how they escaped the dread disease. It seems that they steeped themselves in a concoction of cinnamon, garlic, camphor, cloves, other spices, vinegar and red wine. It worked, and undoubtedly influenced the thinking of the medicos of that day.

So stock your kitchen shelves with spices and herbs. Try some old or new recipes. And do not be afraid to experiment.

FLAT AS A HALIBUT

(Continued from page 484)

aid of intelligent, trained, loyal and enthusiastic experts. It has cheerfully taken the people concerned into its confidence and has won their confidence. But the Commission faces the responsibility and itself makes the decisions.

So this Commission has proved that, where nations sincerely wish to cooperate, they can do so effectively even in the humble field of practical fishery conservation.

Maybe the United Nations would be working more smoothly today if our own government, and other governments, had shown greater interest in practicing with commonplace cooperative efforts of the type of this commission in other fields, as well as fisheries, before launching forth on a spectacular world-wide basis.

BALTIMORES AND SERENDIPITY

(Continued from page 488)

By July 22, my cats had molted twice. I had to forage for their supplies. I learned that frog hoppers (spittle insects), snails, and stalk borers liked turtlehead. By July 24, the Baltimores swarmed on the food given them. They ate as if they had a job to do. They spent the nights in their nest, the days in stuffing themselves. By July 27, they had worn me down. When the month ended, they were suddenly fed up. The third molt and the fast were upon them. By this time, also, they were as brown as their predecessors. Too bad their story had to begin and end in the middle; yet, really, that is where all biography begins. The subject must become worthwhile before it rates a record. It has to be admitted that Job had to have his boils and his reaction before he became a theme.

Helps for Camp Leaders

Margaret Chapman, Marie E. Gaudette and Catherine Hammett, under the group name of "The Rafter Crafters," have brought out what appears to be the first of a series entitled "Program Helps for Camp Leaders." This is a packet of loose-leaf sheets of simple program helps designed to aid the inexperienced camp leader over the first hurdles in getting good outdoor activities started. The authors do not claim any originality for the suggestions because they have been tried in many camps, and by the compilers themselves. This packet costs fifty cents—and well worth it—and the address of The Rafter Crafters is P.O. Box 97, Pleasantville, New York.

Plants Long Ago

Ancient Plants and the World They Lived In. By Henry N. Andrews, Jr. Ithaca, New York. 1947. Comstock Publishing Company. 279 pages. Illustrated. $4.50.

In this book the author, paleobotanist to the Missouri Botanical Garden and associate professor at Washington University, reconstructs the flora of the long past from the evidence of plant fossils.

Chippewas

Chippewa Village. By W. Vernon Kinetz. Bloomfield Hills, Michigan. 1947. Cranbrook Institute of Science. Illustrated. 259 pages. $3.00.

This study of the Chippewa village on Lac Vieux Desert is based primarily upon information collected in 1939 and 1940, and endeavors to present an account of culture change through the centuries of Chippewa occupation of the region south of Lake Superior. The framework is historical, and data from other prevailing Indian communities are used for comparison. The village is on the boundary between Michigan and Wisconsin, and while the settlement, Katikitegou, is no longer marked on the map, the French form, *Lac Vieux Desert*, remains the name of the largest lake in the region.

Mr. Kinietz's study includes chapters on the Indians' dress, dwellings, social organization, dances, religion, etc., giving a comprehensive picture of their integrated community life, conservatism, and relative isolation from their national environment. Particularly enlightening is the chapter entitled "Life Cycle,' which deals with the Indian's life from birth to death and compares their customs as described by observers in the 1800's with prevailing practices.

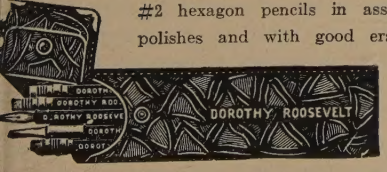
Mr. Kinietz's principal informant was John Pete, an Indian more than seventy years of age, in keeping with the rule of selecting the oldest inhabitants of each community for a revelation of the past. Photographs of specimens in the Chippewa collections of the Cranbrook Institute of Science have been added to enrich Mr. Kinietz's study. These specimens are not known to have come from the specific village of Lac Vieux Desert, but many are from the same region and may be considered representative of the local culture.

"Personal" Name Pencil Sets

INDIVIDUAL NAME IN GOLD

1.00 Post Paid

Genuine leather; well constructed case; has a handy coin pocket on the flap; filled with 5 best-grade #2 hexagon pencils in assorted polishes and with good erasers.



SPECIAL: 6 SETS FOR $5.00

Junior Set—3 pencils in leather case—50¢

MOST ACCEPTABLE AND INDIVIDUAL GIFT

order now

IMPRINT PENCIL CO. 118N Bay 32nd St., Brooklyn 14, N. Y.

NATURE GAMES

GOLDFINCH, A Bird Game. MONARCH, A Butterfly Game. LARKSPUR, A Flower Game. Each of the three games is 60 beautiful pictures in full color, played like authors. Fun to play, accurate for study and identification. Attractive gifts. Prices: $1.00 each; $2.75 for three; $5.00 for six. Wholesale prices to retailers. Nature Games, Angwin, Calif.

PERSONAL

OIL PAINTING from your favorite photo. Send photo for pencil sketch and estimate. F. Longfellow, 728 Washington St., Bath, Maine.

PETS

REGULAR SHIPMENTS of rare tropical Birds, Animals and Reptiles received from all points in Central and South America. We ship anywhere in the WORLD. Write for Price List. Bowers Natural History Supply Co., (West coast office) 512 Santa Monica Blvd., Santa Monica, Calif. (East Coast office) Pinellas Master Airport, St. Petersburg, Florida.

PHOTO FINISHING

EVERY PHOTOGRAPHIC Service! Send for free lists today! Phototron, Musgrove Building, Andover, Mass.

PLANTS

WILD FLOWERS and FERNS to brighten a shady nook. Free Booklet. Wake Robin Farm, R. D., Home, Pennsylvania.

POEMS WANTED

POEMS WANTED FOR MUSICAL SETTING. Send poems for immediate consideration. Hamann Service, 590 Manhattan Building, Milwaukee, Wisc.

POULTRY & SUPPLIES

RAISE FRYERS new easy way. $6000 yearly possible in your backyard. Booklet FREE. Poultry Guild, 1046-K So. Olive, Los Angeles 15, California.

PRINTING

PRINTING MACHINERY, Type, Supplies. Lists 3¢. Turnbaugh Service, Loysville, Penna.

SEA SHELLS

FOSSILS FOR SALE. Cabinet specimens 25 species $3.00. Lists. Carrie B. Williams, Clarksville, Ohio.

SHELLS FOR SALE. Land and Marine; Cape Cod. Special 12 for $1.00 in box; Lists on request. Mrs. F. K. Hadley, Box 33, West Newton, Mass.

SITUATIONS WANTED

Young woman naturalist would like to work with collectors of tropical or subtropical reptiles and mammals. Miss S. Oprysko, 666 North Fifteenth Street, Philadelphia 30, Pa.

SPORTING GOODS

5000 BARGAINS, Firearms, war relics, binoculars, catalog 40¢. John's Gunshop, Runnemede, New Jersey.

STAMPS FOR SALE

1,000 GRABBAGS, 15¢ each. Special Bags 25¢. Andy, 630 Bingaman, Reading, Pennsylvania.

TELESCOPES

SKYSCOPE, the new 3½" reflector. Precision ¼ wave aluminized mirror. Sixty power Ramsden type eyepiece. Equatorially mounted on sturdy metal legs. Used by schools, universities. Price complete $19.75. Write for descriptive literature. The Skyscope Company, Inc., 475 Fifth Ave., New York 17, N. Y.

TAXIDERMY

GLASS EYES. Made in OUR factory. All kinds of Taxidermists' supplies. Complete catalog FREE. J. W. Elwood Co., 223 Elwood Bldg., Omaha, Nebraska.

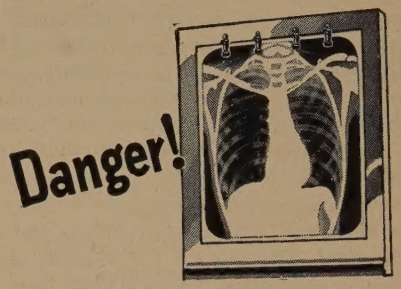
"HOW TO MOUNT ANIMALS," booklet 98¢. Eyes, Scalps, Horns, supplies. Already mounted Deer, Elk, Fur rugs, Birds, Fish. Hofmann, 981-A Gates, Brooklyn 21, N. Y.

BIRDS, ANIMALS & FISH mounted true to life by Osmer D. Cole, R. #1, Box 179, Wisconsin Rapids, Wisc.

WRITING

SELL IN THREE MONTHS OR MONEY BACK If you can write correct English—You can write Juveniles. I have sold some 3000-3500 stories . . . articles . . . editorials . . . serials . . . series. Now I'm teaching. "Instruction—Criticism—Collaboration." Write Dept. N for terms. Will Herman. Author of "My Juvenile Success Secrets" and "My Formula for Fiction." 5703 Broadway—Suite No. 4, Cleveland, O.

I WANT New Writers to cash hundreds of checks for $1 to $100, offered each month. The easiest way to write for pay. No previous experience necessary. Send for free details. No obligation. Saunders M. Cummings, 467-N1 Independence Building, Colorado Springs, Colo.



DO YOU KNOW . . . that there are approximately 250,000 "unknown cases" of tuberculosis?

. . . that TB still kills more Americans between 15 and 44 than any other disease?

. . . that the surest way to discover TB and check its spread is the chest X-ray?

. . . that your Christmas Seal money buys X-ray units and makes possible mass examination?

PLEASE, send in your contribution today.

Buy Christmas Seals

This space contributed by

AMERICAN NATURE ASSOCIATION

The Ten-Year Index

(Volumes One to Twenty)

makes Nature Magazine a textbook. Order yours now . . . 50c

Nature Binder

Preserve your copies of Nature Magazine in a finely grained, dark green, gold-embossed binder . . . $2.50

AMERICAN NATURE ASSOCIATION
1214 16th St., Washington 6, D. C.

Under the Microscope

By JULIAN D. CORRINGTON

PHOTOMICROGRAPHS FROM SLIDES COURTESY WARD'S NATURAL SCIENCE ESTABLISHMENT, INC.

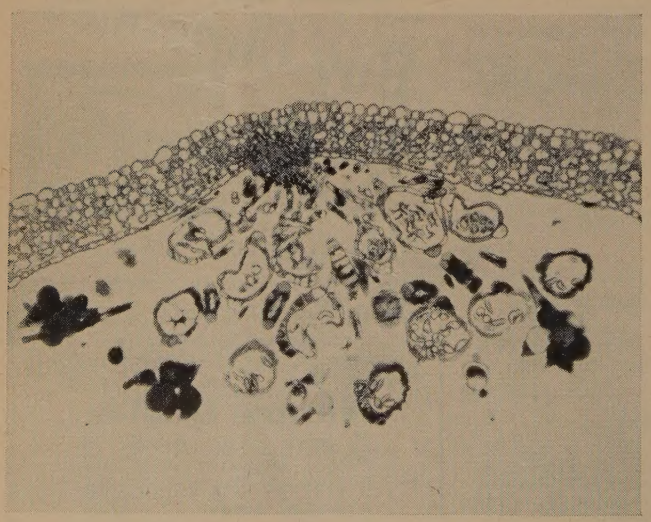
THE STORY OF FERNS

III. Sporophyte

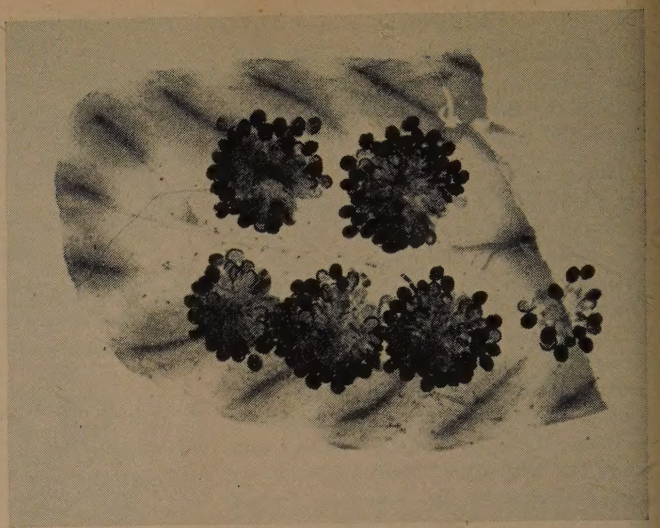
UPON fertilization of an egg by a sperm, the fern sporophyte generation begins. This event takes place in the archegonium of the prothallium, the gametophyte generation and, as is true of embryos in general, the new offspring is dependent upon the female parent for sustenance. By mitosis of the zygote, the embryo sporophyte grows until it consists of many cells, meanwhile proceeding to differentiate into four regions. The *foot* is a mass of cells remaining in place in the venter of the old archegonium and serves the functions of a temporary root in that it provides anchorage and food, the latter by absorption from parent tissues. A slight protrusion below this foot marks the site of the future *stem;* farther out on the same side is a larger extension, the primordium of the *leaf;* while on the opposite side a fourth lobe is the developing *root.*

The primary root grows rapidly and turns downward into the soil, a behavior termed positive geotropism, a response to gravity. No matter in what position the young stage of a vascular plant may artificially be placed, the root will always grow downward. The primary leaf exhibits the opposite reaction, a negative geotropism, growing away from the center of gravity, a behavior well adapted to carry it upward into the light and air. This leaf must grow outward, away from the prothallium, then turn upward through the notch of the heart shape. It soon expands at its tip into a flat blade of several shallow lobes, not at all resembling future leaves of ferns.

The primary root, with many secondary roots, and the primary leaf, which is green and begins the manufacture of food, soon make the new plant independent, and the old prothallium then withers and dies. However, all future tissues of the forthcoming familiar leafy fern plant are destined to arise from the new stem alone. This stem pushes horizontally through the soil as a rhizome or underground stem and, after some time, puts forth a number of adventitious roots and secondary leaves. When these have become well established, the primary root and leaf, having served through a critical period of growth and development, die in their turn.



Cross section of fern leaflet through a sorus, showing many sporangia and contained spores, 50X.



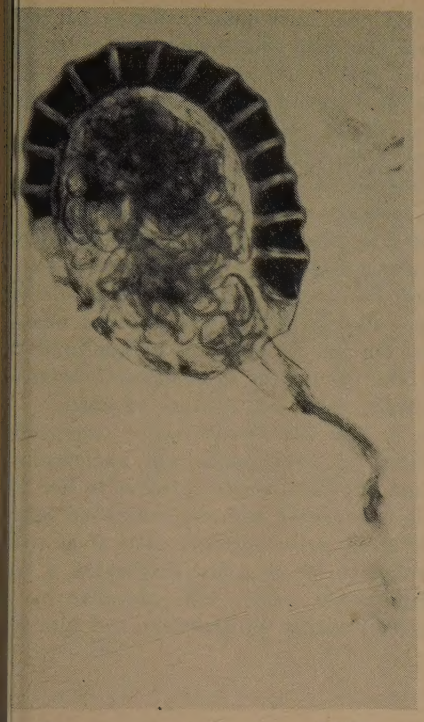
Sori on under side of fern leaflet, 15X. The knobs are sporangia.

A single stem produces numbers of leaves, each coming from a small mass of tissue at the growing tip of the stem at successive intervals of time. Each tightly coiled leaf is pushed above the soil by the growing petiole, and uncurls from base to tip until fully expanded. One function of the green leaf, or frond, is, of course, photosynthesis, the manufacture of food. Another is the production of spores, the fruiting bodies of the sporophyte, by means of which the fern life cycle is continued. All conditions for spore-bearing are met with in the fern group, providing a most interesting series to illustrate the biological principle of division of labor. In many species the leaves are solely vegetative during the greater part of the year, but develop spore-bearing bodies, the *sporangia,* during the fruiting season. The same leaf, or any of its leaflets, may thus be *sterile* at one time and *fertile* at another, the primitive condition. When the leaf is fertile it is termed a *sporophyll* (Gk., *phyll,* leaf).

We may begin with a type like the bracken or brake fern (*Pteridium latiusculum*), in which some of the leaves are photosynthetic only, while others are fertile and perform both functions. The sporangia occur on the undersurface of a sporophyll and also along the edges in diffuse fashion. In the polypody (*Polypodium vulgare*), the sporangia are gathered together in mound-like clusters on the undersides of numerous leaflets of sporophylls, such a mound being a *sorus* (Gk., heap). One of our illustrations shows part of the undersurface of one leaflet with six sori, each exhibiting numerous sporangia. In many species, each sorus is covered with an *indusium* (L., undergarment), a shelf-like extension of the leaf that protects the spore-bearing organs within. Usually most and sometimes all of the leaves of ferns of this type become sporophylls.

The interrupted fern (*Osmunda claytoniana*) goes a step farther in separation of the two functions of sporophylls as modified leaves. In this species a number of pairs of leaflets at about the middle of the blade of a sporophyll are the sole producers of sporangia, and these leaflets are small and brown at maturity, without photosynthetic function, whereas all other leaflets on this same leaf are green and without sporogenous function. When the fertile leaflets fall off, after spore release, the sporophyll of this fern is "interrupted" as to leaflets, with a vacant space on the blade.

In the royal fern (*Osmunda regalis*), a group of leaflets at the terminal end of a sporophyll alone produce spores; all other leaflets are sterile. The grape fern (*Botrychium virginianum*) goes still farther in that the leaf has two main midribs, one bearing sterile leaflets, the other spore-bearing, fertile leaflets.



Fern sporangium, w.m., 330X.

inally, the ostrich fern (*Onoclea struthopteris*), separates the functions completely into two kinds of leaves, a sterile, hotosynthetic leaf, compounded and reen, in typical fern fashion, and fertile porophylls that look like ostrich feathrs, brown when mature. This division of abor continues on through all higher lants, the sporophylls becoming grouped nto cones and then flowers.

An individual sporangium has a short, lender *stalk*, and an expanded *capsule*, he outer layer of cells of which constiutes a *jacket*. Extending from the stalk round one side and part way down the ther is a specialized row of cells, the *nnulus* (L., ring), whose walls are thick nd dark colored on all sides save in ear. When mature, all these jacket cells re dead and dry, and changes in moisture cause the annulus to straighten, splitting the jacket and liberating the contained spores.

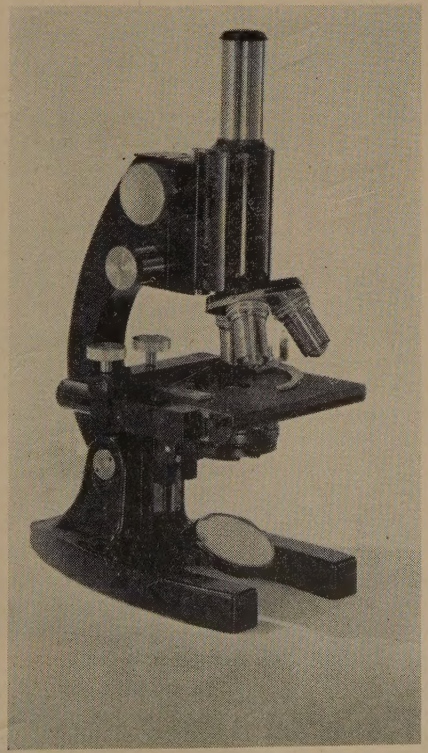
While this structure is developing, the interior cells are undergoing successive mitoses and forming *spore mother cells*. Each of these is diploid, but their two final divisions are like those in the gametes of animals, one being reductional, the other equational. As a result, the tetrad of *mature spores* formed from each mother cell are monoploid, and hence the entire gametophyte that develops when a spore germinates is also monoploid. Our enlarged photomicrograph of a sporangium clearly exhibits the curved, dark-colored annulus, the stalk and, seen through the side wall of the jacket, the contained spores. When the annulus straightens and the jacket splits, many spores are ejected, irregular oblongs in shape and chocolate brown in color, and those that fall upon moist soil will germinate to form the prothallium, or gametophyte generation.

Slides to prepare for the sporophyte phase of the cycle should include small portions of leaflets, mounted entire, sori up; teased sori to provide wholemounts of sporangia; and vertical sections of a leaflet through one or more sori.

Five types of annulus are recognized in different species of ferns—vertical, apical, oblique, equatorial, and rudimentary. There are many forms of indusia; in fact the variation in this structure is used in the classification of genera. Distribution of sori differs greatly. Hence there is almost unlimited opportunity if one should desire to build a collection of slides to display these morphological distinctions. These are in addition to the many types of stem structure exhibited by ferns, a subject requiring separate discussion.

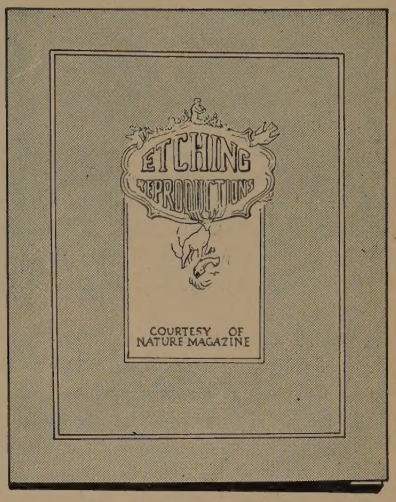
As is true with most botanical materials, young and soft stages should be selected; these make much better and more easily prepared mounts or sections than lignified, old, or dried specimens. Scrape the contents of sori into a stender of chrom-acetic for fixation and carry through hygrobutol dehydration, as per our preceding article in this series. Mount some sporangia unstained; stain others with fast green, tingeing lightly. Carry through small pieces of entire leaflets, with sori, in the same manner, stained lightly with fast green, to prepare a mount after the fashion of our illustration.

Sections of sori to show sporangia with contained spores should be cut 15-20 micra thick and stained with safranin



Bausch and Lomb Medical Microscope.

Portfolios of Etching Reproductions



Ready to Frame

Eight Nature Etching Reproductions 9 x 12 inches in size, carefully selected from a large number of the best works of famous etchers of wild life, and inserted in an attractive portfolio.

★

The Finest Work of Famous Etchers

★

They are exceptionally fine copies. Framed, it will be difficult for the keenest eye to distinguish any of them from an actual print of the original engraving. The subjects are varied, done by outstanding nature artists.

Will Simmons . Polar Maternity
Diana Thorne . Making a Beseech
Richard E. Bishop . The Osprey
Charles Emile Heil . Chewinks
Winifred Austin . Pheasant Brood
L. R. Brightwell . Not Interested
Roland Clark . Gathering of the Clan
Carl Rungius . Lord of the Canyon

$1.00 a set, postage prepaid

These make attractive and inexpensive Christmas gifts.

Send your order today to

American Nature Association

Washington 6, D. C.

NOV 3 1947

and fast green for morphological study; cut 8-10 micra and stained with safranin and fast green or with iron hematoxylin and orange G for chromosomes and meiosis. *Osmunda* is recommended for the latter purpose, and the time of maturation must be known if the reduction division is to be seen; from April 15 to May 15 is indicated in the northern states for most species of this genus.

In sectioning prothallia for antheridia or archegonia, fix and dehydrate, before paraffin embedding, as directed for whole-mounts. Effect changes gradually: go from pure hygrobutol or tertiary butyl alcohol into a mixture of half melted paraffin, half of the dehydrator, for an hour. Large test tubes held in a beaker make excellent infiltration vessels, likewise small beakers. Keep these three-fourths full of melted paraffin or parowax by maintaining them on top of the oven or, if the inside temperature is not too high, place them inside, on a top shelf, away from the heating unit. Another good device is the old-fashioned hotel water pitcher, of porcelain and straight-sided, or a box lined with asbestos, with an electric bulb under the pitcher or inside the box. The distance and wattage of the bulb are easily controlled factors that will determine the heat received by the paraffin in the pitcher or beaker of paraffin in the box.

By one of these devices, maintain the paraffin vessel so that there is solid paraffin on the bottom, melted paraffin above this, and the mixture of paraffin and dehydrator on top, containing the specimens. There must be provision for ventilation, e.g., if a box is used see that there are numerous holes around the inside near the top, so that the dehydrator can evaporate. The prothallia should gradually sink down through the melted paraffin, thus assuring slow infiltration.

One hour after the specimens have sunk to the bottom, change to pure melted paraffin; change twice more, making a total of three paraffin baths, 2 hours each, then embed in fresh paraffin. Cut sections 10 micra thick, vertical to the prothallus, and parallel to the bilateral axis. Stain with safranin and fast green.

Johansen, in *Plant Microtechnique*, one of the leading advocates of hygrobutol as a reagent in dehydration, gives an easy method to observe living sperms. If small pieces of living prothallia bearing mature antheridia and archegonia are mounted in water on a slide and a cover glass is added, antherozoids will shortly be seen swimming about and gathering around the archegonia. He states that malic acid is the substance that attracts the sperm cells and that this may be demonstrated by mounting antheridia only, then adding a drop of weak malic acid solution at one edge of the cover, whereupon the antherozoids will swim to this drop, a clear case, we might add, of love's labor lost.

FAMILY ALBUM

1. The Medical Microscope

Herewith the first installment of a new series in this Department, an account of a particular kind of microscope. We shall follow with descriptions of some of its brothers and sisters, as well as with explorations of such collateral lines, embracing uncles and cousins, as spectroscopes, telescopes, binoculars, and other members of the great family of Optical Instruments.

The genes in this family, that can go together in numberless combinations, are mirrors, prisms, and lenses, each grouping being contrived for a particular purpose. Man, the God of the Machine in this family, has been extremely ingenious in his development of special designs for special needs. Did you know, to mention a few examples, that there is a unique form of microscope for use with invisible ultraviolet light? Another solely for the purpose of watching materials when under many times the force of gravity? Or one that observes substances under strain? Or exclusively for work with sugar? This is by way of whetting your appetite; we're going to tell you about these and other kinfolk from time to time, as we turn the pages of our family album.

When the word "microscope" is mentioned, most people think at once of an instrument identified with the elementary biological laboratory. You used this device when you had your first glimpse of an amœba, or were asked to draw that excellent metaphase in your high school and/or college biology and/or botany and/or zoology course. It is the most universal of microscopes and yet does not have a universal name. Some call it the "laboratory" microscope—yet most of the many kinds of microscopes are operated in laboratories; it is the "school" or "college" microscope—but a large proportion of them are used in hospitals, offices, and factories; another designation is the "biological" microscope—though this science requires several additional models, and the one in question is employed by other than biologists. Our own term is *standard laboratory microscope*, not particularly exact, but perhaps adequate.

This instrument is a monocular-monobjective compound microscope, meaning that it has a single tube, with one eyepiece used at any one time, and likewise a single objective in line for any one observation. It is equipped with an inclination joint, mirror with both plane and concave surfaces, plain stage with two spring clips and either an iris or a disc diaphragm, a low power, 10X, and a high power (dry), 43X, objective on a double, revolving nosepiece, usually no drawtube, and with 5X and 10X eyepieces.

A favorite scion of this branch of the family is the *medical microscope*, capable of precise definition because the demands of medical education have become sufficiently standardized in recent years as to require certain equipment on the instrument medical students must buy or secure on loan.

The stand is of a better grade than in the prototype microscope described above; somewhat larger and heavier. There is the usual two-surfaced mirror, inclination joint, square stage with two spring clips, coarse adjustment, and two eyepieces. The substage mechanism, however, must include a condenser, with iris diaphragm, and a filter holder for either ground-glass or blue light-filter discs, as well as a darkfield stop, all of which are supplied, the accessories fitting in slots in the case when not in use. The nosepiece is triple, seating the aforementioned low and high-dry objectives, along with a third, a 97X oil immersion. The stage must contain a built-in mechanical stage; the side fine adjustment is provided with a micrometer head. The case, with lock, key, and a manual of instructions, is either of polished hardwood or leatherette finish.

The combination of oil-immersion objective and condenser is essential for hematology (blood study) and bacteriology, as well as for numerous miscellaneous observations. For blood counting a mechanical stage is almost obligatory and, in any event, this form of stage lends itself well to many other types of work encountered in the study and practice of medicine. An accessory instrument which the student must purchase for performing blood counts is the hemacytometer, a small device of glass and rubber tubing, along with a special slide and cover glass, and often the case of a medical microscope provides a special compartment for the hemacytometer and another for a box of slides.

It should not be judged from the name that this instrument is the exclusive perquisite of a medical student or doctor; rather it is the best form of monocular-monobjective model in the price class next above the standard laboratory microscope, and is suited to a wide variety of usages. Before the war, such microscopes sold for $155-160 and were supplied by all leading manufacturers and dealers. At the present time no figures can be quoted and the supply is limited, often non-existent. That condition will, of course, be remedied as production begins to catch up with the tremendous demand, brought on largely by the great influx of veterans into our colleges; but the price will continue to remain much higher than pre-war figures, such as the neighborhood of $225-250, for some time to come, as is the case with almost everything else except teachers.